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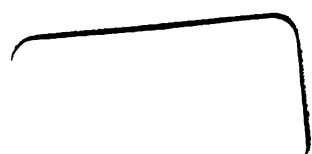
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THE ABRIDGMENT.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES

TO THE

TWO HOUSES OF CONGRESS

AT THE BEGINNING OF THE

SECOND SESSION OF THE FIFTY-FIRST CONGRESS,

WITH THE

REPORTS OF THE HEADS OF DEPARTMENTS

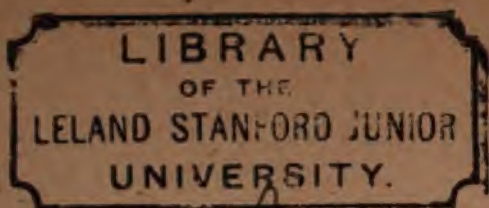
AND

SELECTIONS FROM ACCOMPANYING DOCUMENTS.

EDITED BY

W. H. MICHAEL.

**WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1891.**



NOTE.

This work is authorized by the following statutes:

SEC. 75. The Joint Committee on Public Printing shall appoint a competent person, who shall edit such portion of the documents accompanying the annual report of the Departments as they may deem suitable for popular distribution, and prepare an alphabetical index thereto.

SEC. 196. The head of each Department, except the Department of Justice, shall furnish to the Congressional Printer copies of the documents usually accompanying his annual report on or before the first day of November in each year, and a copy of his annual report on or before the third Monday of November in each year.

SEC. 3798. Of the documents named in this section there shall be printed and bound in addition to the usual number for Congress, the following numbers of copies, namely:

Second. Of the President's message, the annual reports of the Executive Departments, and the abridgment of accompanying documents, unless otherwise ordered, either House, ten thousand copies for the use of the members of the Senate and twenty-five thousand copies for the use of the members of the House of Representatives.

The early delivery of the Abridgment last year met with such hearty approval from Senators and Representatives and the public that the committee under whose supervision the work is performed still urge the utmost promptness in its preparation, printing, and distribution. The value of the work is greatly enhanced by such promptness, hence the precedent set last year will be strictly followed in the future.

The matter for this Abridgment has been selected with a strict view to preserving the gist of the voluminous documents accompanying the annual reports and to secure compactness as far as possible.

The general index is arranged under suitable heads, in black letters, so that the eye may easily catch the subject sought. Thus, the index for the Treasury Department will be found under that head, and arranged alphabetically.

As in the preceding volume, care has been taken in the selection of cloth for the cover and in the character of the binding, in order to make the volume more durable and at the same time fit to be placed on a shelf in company with modern bound books.

MESSAGE.

To the Senate and House of Representatives:

The reports of the several Executive Departments which will be laid before Congress in the usual course will exhibit in detail the operations of the Government for the last fiscal year. Only the more important incidents and results, and chiefly such as may be the foundation of the recommendations I shall submit, will be referred to in this annual message.

The vast and increasing business of the Government has been transacted by the several Departments during the year with faithfulness, energy, and success. The revenues, amounting to above four hundred and fifty million dollars, have been collected and disbursed without revealing, so far as I can ascertain, a single case of defalcation or embezzlement. An earnest effort has been made to stimulate a sense of responsibility and public duty in all officers and employes of every grade, and the work done by them has almost wholly escaped unfavorable criticism. I speak of these matters with freedom because the credit of this good work is not mine, but is shared by the heads of the several Departments with the great body of faithful officers and employes who serve under them. The closest scrutiny of Congress is invited to all the methods of administration and to every item of expenditure.

The friendly relations of our country with the nations of Europe and of the East have been undisturbed, while the ties of good will and common interest that bind us to the States of the Western Hemisphere have been notably strengthened by the Conference held in this capital to consider measures for the general welfare. Pursuant to the invitation authorized by Congress, the representatives of every independent State of the American Continent and of Hayti met in Conference in this capital in October, 1889, and continued in session until the 19th of last April. This important convocation marks a most interesting and influential epoch in the history of the Western

Hemisphere. It is noteworthy that Brazil, invited while under imperial form of government, shared as a Republic in the deliberations and results of the Conference. The recommendations of the Conference were all transmitted to Congress at the last session.

The International Marine Conference, which sat at Washington last winter, reached a very gratifying result. The regulations suggested have been brought to the attention of all the governments represented, and their general adoption is confidently expected. The legislation of Congress at the last session is in conformity with the propositions of the Conference, and the proclamation there provided for will be issued when the other powers have given notice of their adhesion.

The conference of Brussels, to devise means for suppressing the slave trade in Africa, afforded an opportunity for a new expression of the interest the American people feel in that great work. It soon became evident that the measure proposed would tax the resources of the Congo Basin beyond the revenues available under the general act of Berlin of 1884. The United States, not being a party to that act, could not share in its revision, but by a separate act the independent State of the Congo was freed from the restriction upon a customs revenue. The demoralizing and destructive trade in ardent spirits among the tribes also claimed the earnest attention of the conference, and the delegates of the United States were foremost in advocating measures for its repression. An accord was reached, the influence of which will be very helpful and extensive over a wide region. As soon as these measures shall receive the sanction of the Netherlands, for a time withheld, the general act will be submitted for ratification by the Senate. Meanwhile negotiations have been opened for a new and complete treaty of friendship, commerce, and navigation between the United States and the independent State of the Congo.

Toward the end of the past year the only independent monarchy in government on the Western Continent, that of Brazil, ceased to exist and was succeeded by a Republic. Diplomatic relations were at once established with the new government, but it was not completely recognized until an opportunity had been afforded to ascertain that it had popular approval and support. When the course of events had yielded assurance of this fact, no time was lost in extending to the new government a full and cordial welcome into the family

of American Commonwealths. It is confidently believed that the good relations of the two countries will be preserved, and that the future will witness an increased intimacy of intercourse and an expansion of their mutual commerce.

The peace of Central America has again been disturbed through a revolutionary change in Salvador, which was not recognized by other States, and hostilities broke out between Salvador and Guatemala, threatening to involve all Central America in conflict and to undo the progress which had been made toward a union of their interests. The efforts of this Government were promptly and zealously exerted to compose their differences, and through the active efforts of the representative of the United States a provisional treaty of peace was signed August 26, whereby the right of the Republic of Salvador to choose its own rulers was recognized. General Ezeta, the chief of the Provisional Government, has since been confirmed in the Presidency by the Assembly, and diplomatic recognition duly followed.

The killing of General Barrundia on board the Pacific mail steamer *Acapulco*, while anchored in transit in the port of San José de Guatemala, demanded careful inquiry. Having failed in a revolutionary attempt to invade Guatemala from Mexican territory, General Barrundia took passage at Acapulco for Panama. The consent of the representatives of the United States was sought to effect his seizure, first at Champerico, where the steamer touched, and afterwards at San José. The captain of the steamer refused to give up his passenger without a written order from the United States minister; the latter furnished the desired letter, stipulating, as the condition of his action, that General Barrundia's life should be spared and that he should be tried only for offenses growing out of his insurrectionary movements. This letter was produced to the captain of the *Acapulco* by the military commander at San José, as his warrant to take the passenger from the steamer. General Barrundia resisted capture and was killed. It being evident that the minister, Mr. Mizner, had exceeded the bounds of his authority in intervening, in compliance with the demands of the Guatemalan authorities, to authorize and effect, in violation of precedent, the seizure on a vessel of the United States of a passenger in transit charged with political offenses, in order that he might be tried for such offenses under what was described as martial law, I was constrained to disavow Mr. Mizner's act and recall him from his post.

The Nicaragua Canal project, under the control of our citizens is making most encouraging progress, all the preliminary conditions and initial operations having been accomplished within the prescribed time.

During the past year negotiations have been renewed for the settlement of the claims of American citizens against the Government of Chili, principally growing out of the late war with Peru. The reports from our minister at Santiago warrant the expectation of an early and satisfactory adjustment.

Our relations with China, which have for several years occupied so important a place in our diplomatic history, have called for careful consideration and have been the subject of much correspondence.

The communications of the Chinese Minister have brought in review the whole subject of our conventional relations with his country; and at the same time this Government, through its legation at Peking, has sought to arrange various matters and complaints touching the interests and protection of our citizens in China.

In pursuance of the concurrent resolution of October 1, 1890, we have proposed to the Governments of Mexico and Great Britain to consider a conventional regulation of the passage of Chinese laborers across our southern and northern frontiers.

On the 22d day of August last Sir Edmund Monson, the arbitrator selected under the treaty of December 6, 1888, rendered an award to the effect that no compensation was due from the Danish Government to the United States on account of what is commonly known as the Carlos Butterfield claim.

Our relations with the French Republic continue to be cordial. Our representative at that court has very diligently urged the removal of the restrictions imposed upon our meat products, and it is believed that substantial progress has been made towards a just settlement.

The Samoan treaty, signed last year at Berlin by the representatives of the United States, Germany, and Great Britain, after denunciation and exchange has begun to produce salutary effects. The formation of the government agreed upon will soon replace the disorder of the past by a stable administration, alike just to the natives and equitable to the three powers most concerned in trade and intercourse with the Samoan Islands. The chief justice has

been chosen by the King of Sweden and Norway, on the invitation of the three powers, and will soon be installed. The land commission and the municipal council are in process of organization. A rational and evenly distributed scheme of taxation, both municipal and upon imports, is in operation. Malietoa is respected as King.

The new treaty of extradition with Great Britain, after due ratification, was proclaimed on the 25th of last March. Its beneficial working is already apparent.

The difference between the two Governments touching the fur-seal question in the Behring Sea is not yet adjusted, as will be seen by the correspondence which will soon be laid before Congress. The offer to submit the question to arbitration, as proposed by Her Majesty's Government, has not been accepted, for the reason that the form of submission proposed is not thought to be calculated to assure a conclusion satisfactory to either party. It is sincerely hoped that before the opening of another sealing season some arrangement may be effected which will assure to the United States a property right, derived from Russia, which was not disregarded by any nation for more than eighty years preceding the outbreak of the existing trouble.

In the tariff act a wrong was done to the Kingdom of Hawaii which I am bound to presume was wholly unintentional. Duties were levied on certain commodities which are included in the reciprocity treaty now existing between the United States and the Kingdom of Hawaii, without indicating the necessary exception in favor of that kingdom. I hope Congress will repair what might otherwise seem to be a breach of faith on the part of this Government.

An award in favor of the United States in the matter of the claim of Mr. Van Bokkelen against Hayti was rendered on the 4th of December, 1888, but owing to disorders then and afterwards prevailing in Hayti the terms of payment were not observed. A new agreement as to the time of payment has been approved and is now in force. Other just claims of citizens of the United States for redress of wrongs suffered during the late political conflict in Hayti will, it is hoped, speedily yield to friendly treatment.

Propositions for the amendment of the treaty of extradition between the United States and Italy are now under consideration.

You will be asked to provide the means of accepting the invitation of the Italian Government to take part in an approaching conference to consider the adoption of a universal prime meridian from which to reckon longitude and time. As this proposal follows in the train of the reform sought to be initiated by the Meridian Conference, Washington, held on the invitation of this Government, the United States should manifest a friendly interest in the Italian proposal.

In this connection I may refer with approval to the suggestion of my predecessors, that standing provision be made for accepting whenever deemed advisable, the frequent invitations of foreign governments to share in conferences looking to the advancement of international reforms in regard to science, sanitation, commercial laws and procedure, and other matters affecting the intercourse and progress of modern communities.

In the summer of 1889 an incident occurred which for some time threatened to interrupt the cordiality of our relations with the Government of Portugal. That Government seized the Delagoa Bay Railway, which was constructed under a concession granted to an American citizen, and at the same time annulled the charter. The concessionary, who had embarked his fortune in the enterprise, having exhausted other means of redress, was compelled to invoke the protection of his Government. Our representations, made coincidentally with those of the British Government, whose subjects were also largely interested, happily resulted in the recognition by Portugal of the propriety of submitting the claim for indemnity growing out of its action, to arbitration. This plan of settlement having been agreed upon, the interested powers readily concurred in the proposal to submit the case to the judgment of three eminent jurists, to be designated by the President of the Swiss Republic, who, upon the joint invitation of the Governments of the United States, Great Britain, and Portugal, has selected persons well qualified for the task before them.

The revision of our treaty relations with the Empire of Japan has continued to be the subject of consideration and of correspondence. The questions involved are both grave and delicate; and, while it will be my duty to see that the interests of the United States are not by any changes exposed to undue discrimination, I sincerely hope that such revision as will satisfy the legitimate expectations of the Japanese Government, and maintain the present and long existing friendly relations between Japan and the United States, will be effected.

The friendship between our country and Mexico, born of close neighborhood and strengthened by many considerations of intimate intercourse and reciprocal interest, has never been more conspicuous than now, nor more hopeful of increased benefit to both nations. The intercourse of the two countries by rail, already great, is making constant growth. The established lines, and those recently projected, add to the intimacy of traffic and open new channels of access to fresh areas of demand and supply. The importance of the Mexican railway system will be further enhanced, to a degree almost impossible to forecast, if it should become a link in the projected Intercontinental Railway. I recommend that our mission in the City of Mexico be raised to the first class.

The cordial character of our relations with Spain warrants the hope that by the continuance of methods of friendly negotiation much may be accomplished in the direction of an adjustment of pending questions and of the increase of our trade. The extent and development of our trade with the island of Cuba invest the commercial relations of the United States and Spain with a peculiar importance. It is not doubted that a special arrangement in regard to commerce, based upon the reciprocity provision of the recent tariff act, would operate most beneficially for both Governments. This subject is now receiving attention.

The restoration of the remains of John Ericsson to Sweden afforded a gratifying occasion to honor the memory of the great inventor, to whose genius our country owes so much, and to bear witness to the unbroken friendship which has existed between the land which bore him and our own, which claimed him as a citizen.

On the 2d of September last the Commission appointed to revise the proceedings of the Commission under the Claims Convention between the United States and Venezuela of 1866 brought its labors to a close within the period fixed for that purpose. The proceedings of the late Commission were characterized by a spirit of impartiality and a high sense of justice, and an incident which was for many years the subject of discussion between the two Governments has been disposed of in a manner alike honorable and satisfactory to both parties. For the settlement of the claim of the Venezuela Steam Transportation Company, which was the subject of a joint resolution adopted at the last session of Congress, negotiations are still in progress, and their early conclusion is anticipated.

The legislation of the past few years has evinced on the part of Congress a growing realization of the importance of the consular service in fostering our commercial relations abroad and in protecting the domestic revenues. As the scope of operations expands, increased provision must be made to keep up the essential standards of efficiency. The necessity of some adequate measure of supervision and inspection has been so often presented that I need only commend the subject to your attention.

The revenues of the Government from all sources for the fiscal year ending June 30, 1890, were \$463,963,080.55, and the total expenditures for the same period were \$358,618,584.52. The postal receipts have not heretofore been included in the statement of these aggregates, and for the purpose of comparison the sum of \$60,882,097.79 should be deducted from both sides of the account. The surplus for the year, including the amount applied to the sinking fund, was \$105,344,496.03. The receipts for 1890 were \$16,030,923.79 and the expenditures \$15,739,871 in excess of those of 1889. The customs receipts increased \$5,835,842.88 and the receipts from internal revenue \$11,725,191.89, while, on the side of expenditures, that for pensions was \$19,312,075.96 in excess of the preceding year.

The Treasury statement for the current fiscal year, partly actual and partly estimated, is as follows: Receipts from all sources \$406,000,000; total expenditures, \$354,000,000, leaving a surplus of \$52,000,000—not taking the postal receipts into the account on either side. The loss of revenue from customs for the last quarter is estimated at \$25,000,000, but from this is deducted a gain of about \$16,000,000, realized during the first four months of the year.

For the year 1892 the total estimated receipts are \$373,000,000 and the estimated expenditures \$357,852,209.42, leaving an estimated surplus of \$15,147,790.58, which, with a cash balance of \$52,000,000 at the beginning of the year, will give \$67,147,790.58 as the sum available for the redemption of outstanding bonds and other uses. The estimates of receipts and expenditures for the Post Office Department, being equal, are not included in this statement on either side.

The act "directing the purchase of silver bullion and the issue of Treasury notes thereon," approved July 14, 1890, has been administered by the Secretary of the Treasury with an earnest purpose to get into circulation at the earliest possible dates the full monthly amounts of Treasury notes contemplated by its provisions and

the same time to give to the market for silver bullion such support as the law contemplates. The recent depreciation in the price of silver has been observed with regret. The rapid rise in price which anticipated and followed the passage of the act was influenced in some degree by speculation, and the recent reaction is in part the result of the same cause and in part of the recent monetary disturbances. Some months of further trial will be necessary to determine the permanent effect of the recent legislation upon silver values, but it is gratifying to know that the increased circulation secured by the act has exerted and will continue to exert a most beneficial influence upon business and upon general values.

While it has not been thought best to renew formally the suggestion of an international conference looking to an agreement touching the full use of silver for coinage at a uniform ratio, care has been taken to observe closely any change in the situation abroad, and no favorable opportunity will be lost to promote a result which it is confidently believed would confer very large benefits upon the commerce of the world.

The recent monetary disturbances in England are not unlikely to suggest a re-examination of opinions upon this subject. Our very large supply of gold will, if not lost by impulsive legislation in the supposed interest of silver, give us a position of advantage in promoting a permanent and safe international agreement for the free use of silver as a coin metal.

The efforts of the Secretary to increase the volume of money in circulation by keeping down the Treasury surplus to the lowest practicable limit have been unremitting and in a very high degree successful. The tables presented by him, showing the increase of money in circulation during the last two decades, and especially the table showing the increase during the nineteen months he has administered the affairs of the Department, are interesting and instructive. The increase of money in circulation during the nineteen months has been in the aggregate \$93,866,813, or about \$1.50 per capita, and of this increase only \$7,100,000 was due to the recent silver legislation. That this substantial and needed aid given to commerce resulted in an enormous reduction of the public debt and of the annual interest charge is matter of increased satisfaction. There have been purchased and redeemed since March 4, 1889, 4 and 4½ per cent. bonds to the amount of \$211,832,450, at a cost of \$246,620,741, resulting in the reduction of the annual interest charge of \$8,967,609 and a total saving of interest of \$54,576,706.

I notice with great pleasure the statement of the Secretary that the receipts from internal revenue have increased during the last fiscal year nearly \$12,000,000 and that the cost of collecting this larger revenue was less by \$90,617 than for the same purpose in the preceding year. The percentage of cost of collecting the customs revenue was less for the last fiscal year than ever before.

The Customs Administration Board provided for by the act of June 10, 1890, was selected with great care and is composed in part of men whose previous experience in the administration of the old customs regulations had made them familiar with the evils to be remedied, and in part of men whose legal and judicial acquirements and experience seemed to fit them for the work of interpreting and applying the new statute. The chief aim of the law is to secure honest valuations of all dutiable merchandise and to make these valuations uniform at all our ports of entry. It had been made manifest by a Congressional investigation that a system of undervaluation had been long in use by certain classes of importers, resulting not only in a great loss of revenue, but in a most intolerable discrimination against honesty. It is not seen how this legislation, when it is understood, can be regarded by the citizens of any country having commercial dealings with us as unfriendly. If any duty is supposed to be excessive let the complaint be lodged there. It will surely not be claimed by any well-disposed people that a remedy may be sought and allowed in a system of quasi smuggling.

The report of the Secretary of War exhibits several gratifying results attained during the year by wise and unostentatious methods. The percentage of desertions from the Army (an evil for which both Congress and the Department have long been seeking a remedy) has been reduced during the past year 24 per cent., and for the months of August and September, during which time the favorable effects of the act of June 16 were felt, 33 per cent. as compared with the same months of 1889.

The results attained by a reorganization and consolidation of the divisions having charge of the hospital and service records of the volunteer soldiers are very remarkable. This change was effected in July, 1889, and at that time there were 40,654 cases awaiting attention, more than half of these being calls from the Pension Office for information necessary to the adjudication of pension claims. On the 30th day of June last, though over three hundred thousand new calls had come in, there was not a single case that had not been examined and answered.

I concur in the recommendations of the Secretary that adequate and regular appropriations be continued for coast-defense works and ordnance. Plans have been practically agreed upon, and there can be no good reason for delaying the execution of them; while the defenseless state of our great seaports furnishes an urgent reason for wise expedition.

The encouragement that has been extended to the militia of the States, generally and most appropriately designated the "National Guard," should be continued and enlarged. These military organizations constitute, in a large sense, the Army of the United States, while about five-sixths of the annual cost of their maintenance is defrayed by the States.

The report of the Attorney-General is under the law submitted directly to Congress, but as the Department of Justice is one of the Executive Departments some reference to the work done is appropriate here.

A vigorous and, in the main, an effective effort has been made to bring to trial and punishment all violators of the laws; but, at the same time, care has been taken that frivolous and technical offenses should not be used to swell the fees of officers or to harass well-disposed citizens. Especial attention is called to the facts connected with the prosecution of violations of the election laws, and of offenses against United States officers. The number of convictions secured, very many of them upon pleas of guilty, will, it is hoped, have a salutary restraining influence. There have been several cases where postmasters appointed by me have been subjected to violent interference in the discharge of their official duties and to persecutions and personal violence of the most extreme character. Some of these cases have been dealt with through the Department of Justice, and in some cases the post-offices have been abolished or suspended. I have directed the Postmaster-General to pursue this course in all cases where other efforts failed to secure for any postmaster, not himself in fault, an opportunity peacefully to exercise the duties of his office. But such action will not supplant the efforts of the Department of Justice to bring the particular offenders to punishment.

The vacation by judicial decrees of fraudulent certificates of naturalization, upon bills in equity filed by the Attorney-General in the circuit court of the United States, is a new application of a familiar equity jurisdiction. Nearly one hundred such decrees have been taken during the year, the evidence disclosing that a very large number of fraudulent certificates of naturalization have been issued. And in this connection I beg to renew my recommendation that the

laws be so amended as to require a more full and searching inquiry into all the facts necessary to naturalization before any certificates are granted. It certainly is not too much to require that an application for American citizenship shall be heard with as much care and recorded with as much formality as are given to cases involving the pettiest property right.

At the last session I returned, without my approval, a bill entitled "An act to prohibit book-making and pool-selling in the District of Columbia," and stated my objection to be that it did not prohibit, but in fact licensed what it purported to prohibit. An effort will be made under existing laws to suppress this evil, though it is not certain that they will be found adequate.

The report of the Postmaster-General shows the most gratifying progress in the important work committed to his direction. The business methods have been greatly improved. A large economy in expenditures and an increase of four and three-quarters millions in receipts have been realized. The deficiency this year is \$5,786,300 as against \$6,350,183 last year, notwithstanding the great enlargement of the service. Mail routes have been extended and quickened and greater accuracy and dispatch in distribution and delivery have been attained. The report will be found to be full of interest and suggestion, not only to Congress, but to those thoughtful citizens who may be interested to know what business methods can do in that department of public administration which most nearly touches all our people.

The passage of the act to amend certain sections of the Revised Statutes relating to lotteries, approved September 19, 1890, has been received with great and deserved popular favor. The Post-Office Department and the Department of Justice at once entered upon the enforcement of the law with sympathetic vigor, and already the public mails have been largely freed from the fraudulent and demoralizing appeals and literature emanating from the lottery companies.

The construction and equipment of the new ships for the Navy have made very satisfactory progress. Since March 4, 1889, six new vessels have been put in commission, and during this winter four more, including one monitor, will be added. The construction of the other vessels authorized is being pushed, both in the Government and private yards, with energy and watched with the most scrupulous care.

The experiments conducted during the year to test the relative resisting power of armor plates have been so valuable as to attract great attention in Europe. The only part of the work upon the new

ships that is threatened by unusual delay is the armor plating, and every effort is being made to reduce that to the minimum. It is a source of congratulation that the anticipated influence of these modern vessels upon the *esprit de corps* of the officers and seamen has been fully realized. Confidence and pride in the ship among the crew are equivalent to a secondary battery. Your favorable consideration is invited to the recommendations of the Secretary.

The report of the Secretary of the Interior exhibits with great fullness and clearness the vast work of that Department and the satisfactory results attained. The suggestions made by him are earnestly commended to the consideration of Congress, though they can not all be given particular mention here.

The several acts of Congress looking to the reduction of the larger Indian reservations, to the more rapid settlement of the Indians upon individual allotments, and the restoration to the public domain of lands in excess of their needs, have been largely carried into effect, so far as the work was confided to the Executive. Agreements have been concluded since March 4, 1889, involving the cession to the United States of about 14,726,000 acres of land. These contracts have, as required by law, been submitted to Congress for ratification and for the appropriations necessary to carry them into effect. Those with the Sisseton and Wahpeton, Sac and Fox, Iowa, Pottawatomies and Absentee Shawnees, and Cœur d'Alène tribes have not yet received the sanction of Congress. Attention is also called to the fact that the appropriations made in the case of the Sioux Indians have not covered all the stipulated payments. This should be promptly corrected. If an agreement is confirmed, all of its terms should be complied with without delay, and full appropriations should be made.

The policy outlined in my last annual message in relation to the patenting of lands to settlers upon the public domain has been carried out in the administration of the Land Office. No general suspicion or imputation of fraud has been allowed to delay the hearing and adjudication of individual cases upon their merits. The purpose has been to perfect the title of honest settlers with such promptness that the value of the entry might not be swallowed up by the expense and extortions to which delay subjected the claimant. The average monthly issue of agricultural patents has been increased about six thousand.

The disability pension act, which was approved on the 27th June last, has been put into operation as rapidly as was practicable. The increased clerical force provided was selected and assigned work, and a considerable part of the force engaged in examination in the field was recalled and added to the working force of the office. The examination and adjudication of claims have, by reason of improved methods, been more rapid than ever before. There is economy to the Government in delay, while there is much hardship and injustice to the soldier. The anticipated expenditure, very large, will not, it is believed, be in excess of the estimates in force before the enactment of the law. This liberal enlargement of the general law should suggest a more careful scrutiny of bills for special relief, both as to the cases where relief is granted and as to the amount allowed.

The increasing numbers and influence of the non-Mormon population in Utah are observed with satisfaction. The recent letter of Wilford Woodruff, president of the Mormon Church, in which he advised his people "to refrain from contracting any marriage forbidden by the laws of the land," has attracted wide attention, and it is hoped that its influence will be highly beneficial in restraining infractions of the laws of the United States. But the fact should not be overlooked that the doctrine or belief of the church that polygamous marriages are rightful and supported by Divine revelation remains unchanged. President Woodruff does not renounce the doctrine, but refrains from teaching it, and advises against the practice of it because the law is against it. Now, it is quite true that the law should not attempt to deal with the faith or belief of any one, but it is quite another thing, and the only safe thing, so to deal with the Territory of Utah as that those who believe polygamy to be rightful shall not have the power to make it lawful.

The admission of the States of Wyoming and Idaho to the Union are events full of interest and congratulation, not only to the people of those States now happily endowed with a full participation in the privileges and responsibilities, but to all our people. Another line of States stretches from the Atlantic to the Pacific.

The work of the Patent Office has won from all sources very high commendation. The amount accomplished has been very largely increased, and all the results have been such as to secure confidence and consideration for the suggestions of the Commissioner.

The enumeration of the people of the United States under the provisions of the act of March 1, 1889, has been completed and the result will be at once officially communicated to Congress. The completion of this decennial enumeration devolves upon Congress the duty of making a new apportionment of Representatives "among the several States according to their respective numbers."

At the last session I had occasion to return with my objections several bills making provisions for the erection of public buildings, for the reason that the expenditures contemplated were in my opinion greatly in excess of any public need. No class of legislation is more liable to abuse, or to degenerate into an unseemly scramble about the public treasury, than this. There should be exercised in this matter a wise economy based upon some responsible and impartial examination and report as to each case, under a general law.

The report of the Secretary of Agriculture deserves especial attention in view of the fact that the year has been marked in a very unusual degree by agitation and organization among the farmers looking to an increase in the profits of their business. It will be found that the efforts of the Department have been intelligently and zealously devoted to the promotion of the interests intrusted to its care.

A very substantial improvement in the market prices of the leading farm products during the year is noticed. The price of wheat advanced from 81 cents in October, 1889, to \$1.00 $\frac{3}{4}$ in October, 1890; corn from 31 cents to 50 $\frac{1}{4}$ cents; oats from 19 $\frac{1}{4}$ cents to 43 cents, and barley from 63 cents to 78 cents. Meats showed a substantial but not so large an increase. The export trade in live animals and fowls shows a very large increase; the total value of such exports for the year ending June 30, 1890, was \$33,000,000, and the increase over the preceding year was over \$15,000,000. Nearly 200,000 more cattle and over 45,000 more hogs were exported than in the preceding year. The export trade in beef and pork products and in dairy products was very largely increased, the increase in the article of butter alone being from 15,504,978 pounds to 29,748,042 pounds, and the total increase in the value of meat and dairy products exported being \$34,000,000. This trade, so directly helpful to the farmer, it is believed will be yet further and very largely increased when the system of inspection and sanitary supervision now provided by law is brought fully into operation.

The efforts of the Secretary to establish the healthfulness of our meats against the disparaging imputations that have been put upon

them abroad have resulted in substantial progress. Veterinary surgeons sent out by the Department are now allowed to participate in the inspection of the live cattle from this country landed at the English docks, and during the several months they have been on duty no case of contagious pleuro-pneumonia has been reported. This inspection abroad, and the domestic inspection of live animals and products, provided for by the act of August 30, 1890, will afford a perfect guaranty for the wholesomeness of our meats offered for foreign consumption as is anywhere given to any food product, and its non-acceptance will quite clearly reveal the real motive of a continued restriction of their use; and, that having been made clear, the duty of the Executive will be very plain.

The information given by the Secretary of the progress and prospects of the beet-sugar industry is full of interest. It has already passed the experimental stage and is a commercial success. The area over which the sugar beet can be successfully cultivated is very large, and another field crop of great value is offered to the choice of the farmer.

The Secretary of the Treasury concurs in the recommendation of the Secretary of Agriculture that the official supervision provided by the tariff law for sugar of domestic production shall be transferred to the Department of Agriculture.

The law relating to the civil service has, so far as I can learn, been executed by those having the power of appointment in a classified service with fidelity and impartiality, and the service has been increasingly satisfactory. The report of the Commission shows a large amount of good work done during the year with very limited appropriations.

I congratulate the Congress and the country upon the passage of the first session of the Fifty-first Congress of an unusual number of laws of very high importance. That the results of this legislation will be the quickening and enlargement of our manufacturing industries, larger and better markets for our breadstuffs and provisions both at home and abroad, more constant employment and better wages for our working people, and an increased supply of a safe currency for the transaction of business, I do not doubt. Some of the measures were enacted at so late a period that the beneficial effects upon commerce which were in the contemplation of Congress have as yet but partially manifested themselves.

The general trade and industrial conditions throughout the country during the year have shown a marked improvement. For many

years prior to 1888 the merchandise balances of foreign trade had been largely in our favor, but during that year and the year following they turned against us. It is very gratifying to know that the last fiscal year again shows a balance in our favor of over \$68,000,000. The bank clearings, which furnish a good test of the volume of business transacted, for the first ten months of the year 1890 show, as compared with the same months of 1889, an increase for the whole country of about 8.4 per cent., while the increase outside of the city of New York was over 13 per cent. During the month of October the clearings of the whole country showed an increase of 3.1 per cent. over October, 1889, while outside of New York the increase was 11½ per cent. These figures show that the increase in the volume of business was very general throughout the country. That this larger business was being conducted upon a safe and profitable basis is shown by the fact that there were three hundred less failures reported in October, 1890, than in the same month of the preceding year, with liabilities diminished by about \$5,000,000.

The value of our exports of domestic merchandise during the last year was over \$115,000,000 greater than the preceding year, and was only exceeded once in our history. About \$100,000,000 of this excess was in agricultural products. The production of pig-iron—always a good gauge of general prosperity—is shown by a recent census bulletin to have been 153 per cent. greater in 1890 than in 1880, and the production of steel 290 per cent. greater. Mining in coal has had no limitation except that resulting from deficient transportation. The general testimony is that labor is everywhere fully employed, and the reports for the last year show a smaller number of employes affected by strikes and lockouts than in any year since 1884. The depression in the prices of agricultural products had been greatly relieved and a buoyant and hopeful tone was beginning to be felt by all our people.

These promising influences have been in some degree checked by the surprising and very unfavorable monetary events which have recently taken place in England. It is gratifying to know that these did not grow in any degree out of the financial relations of London with our people or out of any discredit attached to our securities held in that market. The return of our bonds and stocks was caused by a money stringency in England, not by any loss of value or credit in the securities themselves. We could not, however, wholly escape the ill effects of a foreign monetary agitation accompanied by such extraordinary incidents as characterized this. It is not believed, however, that these evil incidents, which have for the time unfavorably affected values in this country, can long

withstand the strong, safe, and wholesome influences which operating to give to our people profitable returns in all branches of legitimate trade and industry. The apprehension that our country may again and at once be subjected to important general changes would undoubtedly add a depressing influence of the most serious character.

The general tariff act has only partially gone into operation, some of its important provisions being limited to take effect at dates yet in the future. The general provisions of the law have been in force for more than sixty days. Its permanent effects upon trade and prices are largely stand in conjecture. It is curious to note that the advance in the prices of articles wholly unaffected by the tariff act was by many hastily ascribed to that act. Notice was not taken of the fact that the general tendency of the markets was upward from influences wholly apart from the recent tariff legislation. The enlargement of the currency by the silver bill undoubtedly gave an upward tendency to trade and had a marked effect on prices; but this natural and desired effect of the silver legislation was by many erroneously attributed to the tariff act.

There is neither wisdom nor justice in the suggestion that the subject of tariff revision shall be again opened before this law had a fair trial. It is quite true that every tariff schedule is subject to objections. No bill was ever framed, I suppose, that in all its details and classifications had the full approval even of a party caucus. Such legislation is always and necessarily the product of compromise as to details, and the present law is no exception. But in its general scope and effect I think it will justify the support of those who believe that American legislation should conserve and defend American trade and the wages of American workmen.

The misinformation as to the terms of the act which has been so widely disseminated at home and abroad will be corrected by experience, and the evil auguries as to its results confounded by the market reports, the savings banks, international trade balances, and the general prosperity of our people. Already we begin to hear from abroad and from our custom-houses that the prohibitory effect upon importations imputed to the act is not justified. The imports at the port of New York for the first three weeks of November were nearly 8 per cent. greater than for the same period in 1889, and 29 per cent. greater than in the same period of 1888. And so far from being an act to limit exports, I confidently believe that under it we shall secure a larger and more profitable participation in foreign trade than we have ever enjoyed, and that we shall secure a proportionate participation in the ocean carrying trade of the world.

The criticisms of the bill that have come to us from foreign sources may well be rejected for repugnancy. If these critics really believe that the adoption by us of a free-trade policy, or of tariff rates having reference solely to revenue, would diminish the participation of their own countries in the commerce of the world, their advocacy and promotion by speech and other forms of organized effort of this movement among our people is a rare exhibition of unselfishness in trade. And on the other hand, if they sincerely believe that the adoption of a protective-tariff policy by this country inures to their profit and our hurt, it is noticeably strange that they should lead the outcry against the authors of a policy so helpful to their countrymen, and crown with their favor those who would snatch from them a substantial share of a trade with other lands already inadequate to their necessities.

There is no disposition among any of our people to promote prohibitory or retaliatory legislation. Our policies are adopted not to the hurt of others, but to secure for ourselves those advantages that fairly grow out of our favored position as a nation. Our form of government, with its incident of universal suffrage, makes it imperative that we shall save our working people from the agitations and distresses which scant work and wages that have no margin for comfort always beget. But after all this is done it will be found that our markets are open to friendly commercial exchanges of enormous value to the other great powers.

From the time of my induction into office the duty of using every power and influence given by law to the Executive Department for the development of larger markets for our products, especially our farm products, has been kept constantly in mind, and no effort has been or will be spared to promote that end. We are under no disadvantage in any foreign market, except that we pay our workmen and workwomen better wages than are paid elsewhere—better abstractly, better relatively to the cost of the necessities of life. I do not doubt that a very largely increased foreign trade is accessible to us without bartering for it either our home market for such products of the farm and shop as our own people can supply or the wages of our working people.

In many of the products of wood and iron, and in meats and breadstuffs, we have advantages that only need better facilities of intercourse and transportation to secure for them large foreign markets. The reciprocity clause of the tariff act wisely and effectively opens the way to secure a large reciprocal trade in exchange for the free admission to our ports of certain products. The right of independent nations to make special reciprocal trade concessions is well established, and does not impair either the comity due to other powers

or what is known as the "favored-nation clause," so generally found in commercial treaties. What is given to one for an adequate agreed consideration can not be claimed by another freely. The state of the revenues was such that we could dispense with any import duties upon coffee, tea, hides, and the lower grades of sugar and molasses. That the large advantage resulting to the countries producing and exporting these articles by placing them on the free list entitled us to expect a fair return in the way of customs concessions upon articles exported by us to them was so obvious that to have gratuitously abandoned this opportunity to enlarge our trade would have been an unpardonable error.

There were but two methods of maintaining control of this question open to Congress: to place all of these articles upon the dutiable list, subject to such treaty agreements as could be secured, or to place them all presently upon the free list, but subject to the reimposition of specified duties if the countries from which we received them should refuse to give to us suitable reciprocal benefits. This latter method, I think, possesses great advantages. It expresses in advance the consent of Congress to reciprocity arrangements affecting these products, which must otherwise have been delayed and unascertained until each treaty was ratified by the Senate and the necessary legislation enacted by Congress. Experience has shown that some treaties looking to reciprocal trade have failed to secure a two-thirds vote in the Senate for ratification, and others having passed that stage have for years awaited the concurrence of the House and Senate in such modifications of our revenue laws as were necessary to give effect to their provisions. We now have the concurrence of both Houses in advance in a distinct and definite offer of free entry to our ports of specific articles. The Executive is not required to deal in conjecture as to what Congress will accept. Indeed, this reciprocity provision is more than an offer. Our part of the bargain is complete; delivery has been made; and when the countries from which we receive sugar, coffee, tea, and hides have placed on their free lists such of our products as shall be agreed upon, as an equivalent for our concession, a proclamation of that fact completes the transaction; and in the mean time our own people have free sugar, tea, coffee, and hides.

The indications thus far given are very hopeful of early and favorable action by the countries from which we receive our large imports of coffee and sugar, and it is confidently believed that if steam communication with these countries can be promptly improved and enlarged the next year will show a most gratifying increase in our exports of breadstuffs and provisions, as well as of some important lines of manufactured goods.

In addition to the important bills that became laws before the adjournment of the last session, some other bills of the highest importance were well advanced toward a final vote and now stand upon the calendars of the two Houses in favored positions. The present session has a fixed limit, and if these measures are not now brought to a final vote all the work that has been done upon them by this Congress is lost. The proper consideration of these, of an apportionment bill, and of the annual appropriation bills will require not only that no working day of the session shall be lost, but that measures of minor and local interest shall not be allowed to interrupt or retard the progress of those that are of universal interest. In view of these conditions, I refrain from bringing before you at this time some suggestions that would otherwise be made, and most earnestly invoke your attention to the duty of perfecting the important legislation now well advanced. To some of these measures which seem to me most important I now briefly call your attention.

I desire to repeat with added urgency the recommendations contained in my last annual message in relation to the development of American steamship lines. The reciprocity clause of the tariff bill will be largely limited, and its benefits retarded and diminished, if provision is not contemporaneously made to encourage the establishment of first-class steam communication between our ports and the ports of such nations as may meet our overtures for enlarged commercial exchanges. The steamship, carrying the mails statedly and frequently, and offering to passengers a comfortable, safe, and speedy transit, is the first condition of foreign trade. It carries the order or the buyer, but not all that is ordered or bought. It gives to the sailing vessels such cargoes as are not urgent or perishable, and, indirectly at least, promotes that important adjunct of commerce. There is now both in this country and in the nations of Central and South America a state of expectation and confidence as to increased trade that will give a double value to your prompt action upon this question.

The present situation of our mail communication with Australia illustrates the importance of early action by Congress. The Oceanic Steamship Company maintains a line of steamers between San Francisco, Sydney, and Auckland, consisting of three vessels, two of which are of United States registry and one of foreign registry. For the service done by this line in carrying the mails we pay annually the sum of \$46,000, being, as estimated, the full sea and United States inland postage, which is the limit fixed by law. The colonies of New South Wales and New Zealand have been paying

annually to these lines £37,000 for carrying the mails from Sydney and Auckland to San Francisco. The contract under which the payment has been made is now about to expire, and those colonies have refused to renew the contract unless the United States shall pay a more equitable proportion of the whole sum necessary to maintain the service.

I am advised by the Postmaster-General that the United States receives for carrying the Australian mails, brought to San Francisco in these steamers, by rail to Vancouver an estimated annual income of \$75,000, while, as I have stated, we are paying out for the support of the steamship line that brings this mail to us only \$46,000, leaving an annual surplus, resulting from this service, of \$29,000. The trade of the United States with Australia, which is in a considerable part carried by these steamers, and the whole of which is practically dependent upon the mail communication which they maintain, is largely in our favor. Our total exports of merchandise to Australasian ports during the fiscal year ending June 30, 1899 were \$11,266,484, while the total imports of merchandise from the ports were only \$4,277,676. If we are not willing to see this important steamship line withdrawn, or continued with Vancouver substituted for San Francisco as the American terminal, Congress should put it in the power of the Postmaster-General to make a liberal increase in the amount now paid for the transportation of this important mail.

The South Atlantic and Gulf ports occupy a very favored position towards the new and important commerce which the reciprocal clause of the tariff act and the postal shipping bill are designed to promote. Steamship lines from these ports to some northern ports of South America will almost certainly effect a connection between the railroad systems of the continents long before any continuous line of railroads can be put into operation. The very large appropriation made at the last session for the harbor of Galveston was justified, as it seemed to me, by these considerations. The great Northwest will feel the advantage of trunk lines to the South as well as to the East, and of the new markets opened for their surplus food products and for many of their manufactured products.

I had occasion in May last to transmit to Congress a report adopted by the International American Conference upon the subject of the incorporation of an international American bank, with a view to facilitating money exchanges between the States represented in the conference. Such an institution would greatly promote the trade we are seeking to develop. I renew the recommendation that a care

ful and well-guarded charter be granted. I do not think the powers granted should include those ordinarily exercised by trust, guaranty, and safe-deposit companies, or that more branches in the United States should be authorized than are strictly necessary to accomplish the object primarily in view, namely, convenient foreign exchanges. It is quite important that prompt action should be taken in this matter, in order that any appropriations for better communication with these countries, and any agreements that may be made for reciprocal trade, may not be hindered by the inconvenience of making exchanges through European money centers, or burdened by the tribute which is an incident of that method of business.

The bill for the relief of the Supreme Court has, after many years of discussion, reached a position where final action is easily attainable, and it is hoped that any differences of opinion may be so harmonized as to save the essential features of this very important measure. In this connection I earnestly renew my recommendation that the salaries of the judges of the United States district courts be so readjusted that none of them shall receive less than \$5,000 per annum.

The subject of the unadjusted Spanish and Mexican land grants and the urgent necessity for providing some commission or tribunal for the trial of questions of title growing out of them were twice brought by me to the attention of Congress at the last session. Bills have been reported from the proper committees in both Houses upon the subject, and I very earnestly hope that this Congress will put an end to the delay which has attended the settlement of the disputes as to title between the settlers and the claimants under these grants. These disputes retard the prosperity and disturb the peace of large and important communities. The governor of New Mexico, in his last report to the Secretary of the Interior, suggests some modifications of the provisions of the pending bills relating to the small holdings of farm lands. I commend to your attention the suggestions of the Secretary of the Interior upon this subject.

The enactment of a national bankrupt law I still regard as very desirable. The Constitution having given to Congress jurisdiction of this subject, it should be exercised, and uniform rules provided for the administration of the affairs of insolvent debtors. The inconveniences resulting from the occasional and temporary exercise of this power by Congress, and from the conflicting State codes of insolvency which come into force intermediately, should be removed by the enactment of a simple, inexpensive, and permanent national bankrupt law.

I also renew my recommendation in favor of legislation affording just copyright protection to foreign authors, on a footing of reciprocal advantage for our authors abroad.

It may still be possible for this Congress to inaugurate, by suitable legislation, a movement looking to uniformity and increased safety in the use of couplers and brakes upon freight trains engaged in interstate commerce. The chief difficulty in the way is to secure agreement as to the best appliances, simplicity, effectiveness, and cost being considered. This difficulty will only yield to legislation which should be based upon full inquiry and impartial tests. The purpose should be to secure the co-operation of all well-disposed managers and owners, but the fearful fact that every year's delay involves the sacrifice of two thousand lives and the maiming of twenty thousand young men should plead both with Congress and the managers against any needless delay.

The subject of the conservation and equal distribution of water supply of the arid regions has had much attention from Congress, but has not as yet been put upon a permanent and satisfactory basis. The urgency of the subject does not grow out of a large present demand for the use of these lands for agriculture, but out of the danger that the water supply and the sites for the necessary catch-basins may fall into the hands of individuals or private corporations and be used to render subservient the large area dependent upon such supply. The owner of the water is the owner of the lands, however the titles may run. All unappropriated rural water sources and all necessary reservoir sites should be held by the Government for the equal use, at fair rates, of the homestead settlers who will eventually take up these lands. The United States should not, in my opinion, undertake the construction of dams and canals, but should limit its work to such surveys and observations as will determine the water supply, both surface and subterranean, the areas capable of irrigation, and the location and storage capacity of reservoirs. This done, the use of the water and of the reservoir sites might be granted to the respective States or Territories, or to individuals or associations upon the condition that the necessary works should be constructed and the water furnished at fair rates without discrimination, the rates to be subject to supervision by the legislatures or by boards of water commissioners duly constituted. The essential thing to be secured is the common and equal use at fair rates of the accumulated water supply. It were almost better that these lands should remain arid than that those who

occupy them should become the slaves of unrestrained monopolies controlling the one essential element of land values and crop results.

The use of the telegraph by the Post-Office Department as a means for the rapid transmission of written communications is, I believe, upon proper terms quite desirable. The Government does not own or operate the railroads, and it should not, I think, own or operate the telegraph lines. It does, however, seem to be quite practicable for the Government to contract with the telegraph companies, as it does with the railroad companies, to carry at specified rates such communications as the senders may designate for this method of transmission. I recommend that such legislation be enacted as will enable the Post-Office Department fairly to test by experiment the advantages of such a use of the telegraph.

If any intelligent and loyal company of American citizens were required to catalogue the essential human conditions of national life, I do not doubt that with absolute unanimity they would begin with "free and honest elections." And it is gratifying to know that generally there is a growing and non-partisan demand for better election laws. But against this sign of hope and progress must be set the depressing and undeniable fact that election laws and methods are sometimes cunningly contrived to secure minority control, while violence completes the shortcomings of fraud.

In my last annual message I suggested that the development of the existing law providing a Federal supervision of Congressional elections offered an effective method of reforming these abuses. The need of such a law has manifested itself in many parts of the country, and its wholesome restraints and penalties will be useful in all. The constitutionality of such legislation has been affirmed by the Supreme Court. Its probable effectiveness is evidenced by the character of the opposition that is made to it. It has been denounced as if it were a new exercise of Federal power and an invasion of the rights of the States. Nothing could be further from the truth. Congress has already fixed the time for the election of Members of Congress. It has declared that votes for Members of Congress must be by written or printed ballot; it has provided for the appointment by the circuit courts in certain cases, and upon the petition of a certain number of citizens, of election supervisors, and made it their duty to supervise the registration of voters conducted by the State officers; to challenge persons offering to register; to personally inspect and scrutinize the registry lists, and to affix their names to

the lists for the purpose of identification and the prevention of fraud to attend at elections and remain with the boxes till the votes are all cast and counted; to attach to the registry lists and election returns any statement touching the accuracy and fairness of the registry and election, and to take and transmit to the Clerk of the House of Representatives any evidence of fraudulent practices which may be presented to them. The same law provides for the appointment of deputy United States marshals to attend at the polls, support the supervisors in the discharge of their duties, and to arrest persons violating the election laws. The provisions of this familiar title of the Revised Statutes have been put into exercise by both the great political parties, and in the North as well as in the South, by filing with the court of the petitions required by the law.

It is not, therefore, a question whether we shall have a Federal election law, for we now have one, and have had for nearly twenty years, but whether we shall have an effective law. The present law stops just short of effectiveness, for it surrenders to the local authorities all control over the certification which establishes a *prima facie* right to a seat in the House of Representatives. This defect should be cured. Equality of representation and the parity of the electors must be maintained, or everything that is valuable in our system of government is lost. The qualifications of an elector must be sought in the law, not in the opinions, prejudices, or feelings of any class, however powerful. The path of the elector to the ballot box must be free from the ambush of fear and the enticements of fraud; the count so true and open that none shall gainsay it. Such a law should be absolutely non-partisan and impartial. It should give the advantage to honesty and the control to majorities. Surely there is nothing sectional about this creed, and, if it shall happen that the penalties of laws intended to enforce these rights fall here and not there, it is not because the law is sectional, but because happily, crime is local and not universal. Nor should it be forgotten that every law, whether relating to elections or to any other subject, whether enacted by the State or by the Nation, has force behind it: the courts, the marshal or constable, the *posse comitatus*, the prison, are all and always behind the law.

One can not be justly charged with unfriendliness to any section or class who seeks only to restrain violations of law and of personal right. No community will find lawlessness profitable. No community can afford to have it known that the officers who are charged with the preservation of the public peace and the restraint of the criminal classes are themselves the product of fraud or violence. The magistrate is then without respect and the law without sanction.

The floods of lawlessness can not be leveed and made to run in one channel. The killing of a United States marshal carrying a writ of arrest for an election offense is full of prompting and suggestion to men who are pursued by a city marshal for a crime against life or property.

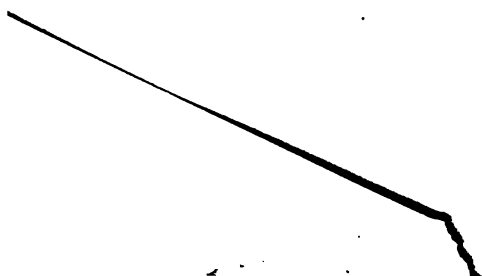
But it is said that this legislation will revive race animosities, and some have even suggested that when the peaceful methods of fraud are made impossible they may be supplanted by intimidation and violence. If the proposed law gives to any qualified elector, by a hair's weight, more than his equal influence, or detracts by so much from any other qualified elector, it is fatally impeached. But, if the law is equal and the animosities it is to evoke grow out of the fact that some electors have been accustomed to exercise the franchise for others as well as for themselves, then these animosities ought not to be confessed without shame, and can not be given any weight in the discussion without dishonor. No choice is left to me but to enforce with vigor all laws intended to secure to the citizen his constitutional rights, and to recommend that the inadequacies of such laws be promptly remedied. If to promote with zeal and ready interest every project for the development of its material interests, its rivers, harbors, mines, and factories, and the intelligence, peace, and security under the law of its communities and its homes, is not accepted as sufficient evidence of friendliness to any State or section, I can not add connivance at election practices that not only disturb local results, but rob the electors of other States and sections of their most priceless political rights.

The preparation of the general appropriation bills should be conducted with the greatest care and the closest scrutiny of expenditures. Appropriations should be adequate to the needs of the public service, but they should be absolutely free from prodigality.

I venture again to remind you that the brief time remaining for the consideration of the important legislation now awaiting your attention offers no margin for waste. If the present duty is discharged with diligence, fidelity, and courage, the work of the Fifty-first Congress may be confidently submitted to the considerate judgment of the people.

BENJ. HARRISON.

EXECUTIVE MANSION,
December 1, 1890.



REPORT.

TREASURY DEPARTMENT,
Washington, D. C., December 1, 1890.

SIR: I have the honor to submit the following report:

RECEIPTS AND EXPENDITURES.

Fiscal year 1890.

The revenues of the Government from all sources for the fiscal year ended June 30, 1890, were:

From customs.....	\$229,668,584 57
From internal revenue.....	142,606,705 81
From profits on coinage, bullion deposits, and assays.....	10,217,344 25
From sales of public lands.....	6,358,272 51
From fees—consular, letters-patent, and land.....	3,146,692 32
From sinking-fund for Pacific railways.....	1,842,584 52
From tax on national banks.....	1,301,326 58
From customs fees, fines, penalties, and forfeitures.....	1,299,324 52
From repayment of interest by Pacific railways.....	705,691 52
From sales of Indian lands.....	372,285 15
From Soldiers' Home, permanent fund.....	308,886 99
From tax on seal-skins.....	262,500 00
From immigrant fund.....	241,464 00
From sales of Government property.....	192,123 98
From deposits for surveying public lands.....	112,314 79
From depredations on public lands.....	35,859 37
From the District of Columbia.....	2,809,130 93
From miscellaneous sources.....	1,600,014 81
From postal service.....	60,882,097 92
Total receipts.....	<u>463,963,080 55</u>

The expenditures for the same period were:

For civil expenses.....	\$23,638,826 62
For foreign intercourse.....	1,648,276 59
For Indian service.....	6,708,046 67
For pensions.....	106,936,855 07
For the military establishment, including rivers and harbors and arsenals.....	44,582,838 08
For the naval establishment, including vessels, machinery, and improvements at navy-yards.....	22,006,206 24
For miscellaneous objects, including public buildings, light-houses, and collecting the revenues.....	43,563,696 85
For the District of Columbia.....	5,677,419 52
For interest on the public debt.....	38,099,284 05
For deficiency in postal revenues.....	6,875,036 91
For postal service.....	60,882,097 92
Total expenditures.....	<u>358,618,584 52</u>

The revenues and expenditures of the postal service form no part of the fiscal operations controlled by the Treasury Department, although under a requirement of law enacted at the last session of Congress, they are included in the tables above presented. Deducting these from the aggregate on both sides of the account there remain as the ordinary revenues of the Government the sum of \$403,080,982.63 and as ordinary expenditures the sum of \$297,736,486.60, leaving a surplus of \$105,344,496.03. Of this amount there was used in the redemption of notes and fractional currency, and purchase of bonds for the sinking fund, the sum of \$48,094,564.66, leaving a net surplus for the year of \$57,249,931.37.

As compared with the fiscal year 1889, the receipts for 1890 had increased \$16,030,923.79, as follows:

Source.	Increase.	Decrease.	Net increase.
Internal revenue.....	\$11,725,191 80		
Customs.....	5,835,842 88		
Sinking-fund for Pacific railways.....	521,459 99		
Revenues of the District of Columbia.....	285,180 24		
Fees on letters-patent.....	203,107 13		
Repayment of interest by Pacific railways.....	101,926 80		
Customs enrolment fees.....	84,511 65		
Customs fines, penalties, and forfeitures.....	52,097 63		
Profits on coinage, assays, etc.....	51,979 46		
Custom-house fees.....	49,294 46		
Deposits for surveying public lands.....	16,426 16		
Immigrant fund.....	5,267 50		
Sales of public lands.....		\$1,680,379 28	
Consular fees.....		315,167 88	
Soldiers' Home, permanent fund.....		283,540 26	
Tax on circulation of national banks.....		234,760 58	
Registers' and receivers' fees.....		119,310 52	
Sales of Government property.....		103,406 43	
Sales of Indian lands.....		73,970 04	
Tax on seal-skins.....		55,000 00	
Depredations on public lands.....		29,581 92	
Miscellaneous items.....		6,595 09	
Total.....	18,932,735 79	2,901,812 00	\$16,030,923 79

There was an increase of \$15,739,871 in the ordinary expenditures as follows:

Source.	Increase.	Decrease.	Net increase.
Pensions.....	\$19,312,075 06		
Civil and miscellaneous.....	739,192 23		
Navy Department.....	627,396 93		
War Department.....	147,567 23		
Interest on the public debt.....		\$4,902,200 24	
Indian service.....		184,161 11	
Total.....	20,826,232 45	5,086,361 35	\$15,739,871 10

In addition to \$48,094,564.66 applied to the sinking-fund during the fiscal year 1890, the net surplus for the year, viz, \$57,249,931.37, together with \$5,870 received for four per cent. bonds issued for inter-

accrued on refunding certificates converted during the year, and \$19,601,877.53 taken from the cash balance in the Treasury at the beginning of the year, making altogether \$76,857,678.90, was used in the redemption and purchase of the debt, as follows :

Redemption of—	
Loan of July and August, 1861.....	\$4,100 00
Loan of July and August, 1861, continued at 3½ per cent.....	2,300 00
Loan of 1863.....	2,500 00
Loan of 1863, continued at 3½ per cent.....	1,500 00
Five-twenties of 1862.....	1,850 00
Five-twenties of June, 1864.....	50 00
Five-twenties of 1865.....	3,200 00
Consols of 1865.....	2,750 00
Consols of 1867.....	11,450 00
Ten-forties of 1864.....	3,000 00
Funded loan of 1881.....	1,800 00
Funded loan of 1881, continued at 3½ per cent.....	5,200 00
Loan of 1882.....	43,750 00
Old demand, compound interest, and other notes.....	2,330 00
Purchase of—	
Funded loan of 1891.....	18,486,500 00
Funded loan of 1907.....	46,227,900 00
Premium on funded loan of 1891.....	716,634 08
Premium on funded loan of 1907.....	11,340,864 82
Total.....	76,857,678 90

Fiscal year 1891.

For the present fiscal year the revenues are estimated as follows :

From customs.....	\$221,000,000 00
From internal revenue.....	145,000,000 00
From miscellaneous sources.....	40,000,000 00
Total estimated revenues.....	406,000,000 00

The expenditures for the same period are estimated as follows :

For the civil establishment.....	\$105,000,000 00
For the military establishment.....	44,500,000 00
For the naval establishment.....	23,000,000 00
For the Indian service.....	6,500,000 00
For pensions.....	133,000,000 00
For the District of Columbia.....	5,500,000 00
For interest on the public debt.....	32,000,000 00
For deficiency in postal revenues.....	4,500,000 00
Total estimated expenditures.....	354,000,000 00
Leaving an estimated surplus for the year of.....	52,000,000 00

Including the revenues to be derived from the postal service, which are estimated at \$66,000,000, but which, as already stated, have not been heretofore included in these tables of receipts and expenditures, the total estimated revenues of the Government for the fiscal year 1891 will be \$472,000,000, and the total estimated expenditures \$420,000,000, leaving an available surplus of \$52,000,000, as shown above.

If to the estimated surplus there be added the cash in the Treasury at the beginning of the year and the national bank fund deposits in the Treasury under the act of July 14, 1890, the total available at the beginning of the year, exclusive of fractional silver and minor coin, will be \$162,000,000. There has been paid out during the first four months of the year in the purchase of bonds for the sinking-fund and in other redemptions of the debt, including premium, about \$100,000,000. It is estimated that the redemptions of four and a half per cent. bonds during the remaining eight months of the year will be \$10,000,000, making a total outlay for bonds purchased during the year, including premium of \$110,000,000, leaving a net balance on June 30, 1891, of \$52,000,000 available during the next fiscal year.

The estimate of revenue to be derived from customs during the present fiscal year is based upon the assumption that there will be a probable loss from articles placed on the free list, including sugar, during the last quarter of the year amounting to twenty-five million dollars; but as there has been an increase of sixteen million in the duties collected during the first four months of the year, the estimated net revenue for the year is placed at nine million dollars.

Fiscal year 1892.

It is estimated that the revenues of the Government for the fiscal year 1892 will be:

From customs.....	\$189,000,000
From internal revenue.....	150,000,000
From miscellaneous sources.....	34,000,000
Total estimated revenues.....	373,000,000

The estimates of expenditures for the same period, as submitted by the several Executive Departments and offices, are as follows:

Legislative establishment.....	\$3,539,600
Executive establishment—	
Executive proper.....	\$173,120 00
State Department.....	155,510 00
Treasury Department.....	8,943,605 80
War Department.....	2,248,370 00
Navy Department.....	426,930 00
Interior Department.....	5,429,324 00
Post-Office Department.....	939,720 00
Department of Agriculture.....	2,812,003 50
Department of Justice.....	195,450 00
Department of Labor.....	175,520 00
Judicial establishment.....	21,499,500
Foreign intercourse.....	462,100
Military establishment.....	1,942,600
Naval establishment.....	26,160,900
Indian affairs.....	32,508,300
Pensions.....	6,846,000
	135,263,000

Public Works—		
Legislative.....	\$708,600 00	
Treasury Department.....	7,259,070 42	
War Department.....	10,694,788 93	
Navy Department.....	923,375 13	
Interior Department.....	307,370 00	
Department of Justice.....	4,500 00	
		<hr/> \$12,601,704 48
Miscellaneous—		
Legislative.....	3,014,916 69	
Treasury Department.....	10,512,912 75	
War Department.....	6,002,226 07	
Interior Department.....	3,727,611 00	
Department of Justice.....	4,262,800 00	
District of Columbia.....	5,450,215 17	
		<hr/> 32,974,681 68
Deficiency in postal revenues.....		3,590,862 42
Permanent annual appropriations—		
Interest on the public debt.....	27,000,000 00	
Refunding—customs, internal revenue, etc.....	18,076,380 00	
Collecting revenue from customs.....	5,500,000 00	
Miscellaneous.....	22,685,500 00	
		<hr/> 73,261,680 00
Total estimated expenditures, exclusive of sinking-fund.....		<hr/> 357,852,209 42
Or an estimated surplus of.....		<hr/> 15,147,790 58

Which, added to the available balance at the beginning of the year (\$32,000,000), will make a total of \$67,147,790.58 available for the redemption of the four and a half per cent. bonds falling due September 1, 1891, of which it is estimated there will remain outstanding on July 1, 1891, \$51,531,900 the amount outstanding November 22, 1890, being \$51,531,900. Of the bonds to be so retired \$49,224,928 will be applied to the sinking-fund.

The revenue and expenditures of the postal service for the fiscal year 1892 are estimated at \$73,955,031.98, which, added to the ordinary revenues and expenditures of the Government, will make a total revenue for the year of \$446,955,031.98 and a total expenditure of \$431,807,241.40, leaving an estimated surplus, as shown above, of \$15,147,790.58.

The increase of \$65,580,804.72 in the estimates for 1892 over the estimates for 1891 is to be found under the following heads: Pensions, \$36,676,000 increase; naval establishment, \$8,217,700 increase; Executive establishment, \$2,517,700 increase; Indian service, \$1,042,500 increase; public works, \$794,000 increase; military establishment, \$758,000 increase; making a total of \$50,005,900. The balance of the increase is due to the estimated expenditure for redemption of national bank notes, and for bounty on the production of sugar, less a decrease of \$4,500,000 in the estimate for interest on the public debt, and a further decrease of about \$3,000,000 under the respective heads of "permanent annual appropriations" and "miscellaneous."

In estimating the revenue for the next fiscal year the loss from art transferred to the free list is placed at fifty million, but as the increased demands of the people must swell the volume of imports in other commodities, and the enforcement of the customs laws under the operation of the administrative act of June 10, 1890, by the prevention of undervaluations and the closer collection of duties, will materially increase the revenue, it is estimated that an additional collection of not less than eighteen million will be obtained under these conditions. Upon this basis the net loss of revenue for the year is put down at thirty million dollars.

Pensions.

The above estimate of \$135,263,085, made by the Interior Department, for the year 1892, is based upon the fact that over 250,000 claimants for pensions under old laws have availed themselves of their right to present their claims under the act of June 27, 1890. Claims presented under the new law will draw a less monthly rate, and carry arrearages for only a short time, and for small amounts, while under old laws many of them carry very large arrearages, and many of which will have been paid during the fiscal year 1891. The transfer of claims from the old to the new law will therefore very largely reduce the average annual value of pensions, and a reduction in the amount of arrearages alone is estimated at \$10,000,000 for the year 1892. For these reasons it is estimated that the amount above named for pensions will be sufficient to meet the aggregate requirements for that year.

It is deemed advisable and opportune at this time to recommend a change in the periods of paying pensions. At present the law requires that payments to pensioners shall be made quarterly on the fourth of March, June, September, and December in each year, which necessarily involves the accumulation of large sums in the Treasury, amounting to from thirty to thirty-five millions of dollars for each quarterly payment. This unnecessary withholding of money from circulation may be obviated by making twelve monthly payments instead of quarterly payments, as now required. Upon consultation with the Secretary of the Interior it is suggested that the law be changed as to divide the eighteen pension agencies into three groups, as follows: The pension agencies at Columbus, Ohio, Washington, D. C., Boston, Mass., Detroit, Mich., Augusta, Me., and San Francisco, to make their payments quarterly on the fourth day of March, June, September, and December; the pension agencies at Indianapolis, Des Moines, Iowa, Buffalo, N. Y., Milwaukee, Wis., Louisville, Ky., and Pittsburgh, Pa., to make their payments quarterly upon the first

day of April, July, October, and January; and the pension agencies at Topeka, Kans., Chicago, Ill., Philadelphia, Pa., Knoxville, Tenn., New York City, N. Y., and Concord, N. H., to make their payments quarterly on the fourth day of May, August, November, and February of each year.

During the last fiscal year the first group of agencies disbursed \$33,953,822; the second group disbursed \$35,987,186; and the third group disbursed \$36,552,882, and it is probable that this ratio will be substantially maintained in the future.

If the change herein recommended should receive favorable consideration, a provision should be incorporated, in any amendment to the present law that may be adopted, providing for preliminary payments for fractional quarters rendered necessary by the change at all the agencies, the date of whose regular payments is changed, and also in all cases of transfer of pensioners from one agency to another.

Sinking-fund.

Under the requirements of the act of February 25, 1862 (Revised Statutes, §§ 3688, 3689), establishing a sinking-fund for the gradual extinguishment of the public debt, there have been purchased during the months of July, August, September, and October of the current fiscal year \$27,859,100 of the funded loan of 1891 and \$16,134,000 of the funded loan of 1907, at a cost to the fund for premium and anticipated interest of \$1,226,329.76 on the former and \$3,844,450.93 on the latter loan. There have also been added to the fund, by the redemption of fractional currency, Treasury notes, and United States bonds which had ceased to bear interest, the sum of \$8,764, making a total of \$49,072,784.97 applied to the fund as against an estimated requirement for the year of \$49,077,270.

SURPLUS REVENUE.

The surplus revenue was largely increased last summer by the pending changes in tariff legislation. And the available balance in the Treasury was also greatly augmented by the act of July 14, 1890, which transferred over \$54,000,000 from the bank-note redemption fund to the available cash. This sudden and abnormal increase was the cause of much concern and some embarrassment to the Department.

To prevent an undue accumulation of money in the Treasury, and consequent commercial stringency, only two methods were open to the Secretary, namely, to deposit the public money in national banks, or to

continue the purchase of United States bonds on such terms as could be obtained. For reasons heretofore stated, the former measure was deemed unwise and inexpedient, and the policy of bond purchase was continued. On account of the rapidly-diminishing supply of United States bonds on the market, and of the fact that the sudden and great increase in the surplus compelled the immediate purchase of large quantities, it became very difficult to obtain them in sufficient amount and at fair prices. The following is a brief statement of the successive steps taken to dispose of the constantly-accumulating surplus:

There were outstanding on June 30, 1889, United States interest-bearing bonds, issued under the refunding act, in the amount of \$815,734, of which \$676,095,350 were four percents and \$139,639,000 four and one-half percents. During the fiscal year 1890 there were purchased these bonds \$73,923,500 fours and \$30,623,250 four and one-half percents, and there remained outstanding June 30, 1890, \$602,193,500 fours including \$21,650 issued for refunding certificates, and \$109,015,750 four and one-half percents. Of the bonds so purchased there were applied to the sinking-fund for the fiscal year 1890 \$27,695,600 fours and \$136,750 four and one-half percents, the residue being ordinary redemptions of the debt.

During this period the Secretary was able to purchase United States bonds at constantly-decreasing prices, so that at the end of the fiscal year 1890 the Government was paying for four per cent. bonds six per cent. less than at the beginning of that period, and for four and one-half per cent. bonds four and one-half per cent. less; but the diminishing supply of bonds held for sale, together with the lower prices which were being paid, had been gradually curtailing the Government purchases, and soon after the beginning of the present fiscal year the growing surplus and the prospective needs of the country made it advisable that steps be taken to obtain more free offerings of bonds to the Government.

Accordingly, on July 19, 1890, a circular was published rescinding that under which purchases had been made since April 17, 1888, and inviting new proposals, to be considered July 24, for the sale of two classes of bonds before mentioned. Under this circular there were offered on the day prescribed \$6,408,350 four percents and \$594,000 four and one-half percents, at prices varying from 121.763 to 128.00 for fours, and from 103½ to 104.40 for four and one-halves, of which there were purchased all the four percents offered at 124, or less, amounting to \$6,381,350, and all the four and one-halves offered at 103½, or less, amounting to \$584,550. As the amount obtained on this day was less than the Government desired to purchase, the provisions of the circular

were extended, with the result that further purchases were made, amounting in the aggregate to \$9,652,500 four and \$706,450 four and one-half percents.

It was soon apparent that these purchases were inadequate to meet existing conditions; therefore, on August 19, the Department gave notice that four and one-half per cent. bonds would be redeemed with interest to and including May 31, 1891; and two days later the circular of August 21 was published, inviting the surrender for redemption of twenty millions of those bonds, upon condition of the prepayment after September 1, 1890, of all the interest to and including August 31, 1891, on the bonds so surrendered. Under this circular there were redeemed \$20,060,700 four and one-half percents.

Notwithstanding the disbursements resulting from purchases and redemptions of bonds under the circulars of July 19 and August 21, the industrial and commercial interests of the country required that large additional amounts should be at once returned to the channels of trade. Accordingly, a circular was published August 30, 1890, inviting the surrender of an additional twenty millions of four and one-half percents upon the same terms as before. This was followed by another, dated September 6, inviting holders of the four per cent. bonds to accept prepayment of interest on those bonds to July 1, 1891, a privilege which was subsequently extended to the holders of currency sixes. Under this circular of August 30, there were redeemed \$18,678,100 four and one-half per cent. bonds, and under that of September 6 there was prepaid on the four per cent. bonds and currency sixes interest amounting to \$12,009,951.50.

These prepayments of interest are expressly authorized by section 3699 of the Revised Statutes. They were deemed expedient because of the disposition of the holders of bonds to demand exorbitant prices for them.

The amount of public money set free within seventy-five days by these several disbursements was nearly \$76,660,000, and the net gain to circulation was not less than forty-five millions of dollars, yet the financial conditions made further prompt disbursements imperatively necessary. A circular was, therefore, published September 13, 1890, inviting proposals, to be considered on the 17th, for the sale, to the Government, of sixteen millions of four per cent. bonds. The offerings under this circular amounted to \$35,514,900, of which \$17,071,150 were offered at 126½, or less, and were accepted.

The total disbursements since June 30, 1890, by the means all set forth, are recapitulated as follows:

	Bonds re- deemed.	Disbur- sements.
Under circular of April 17, 1889.....	\$2,133,350	\$2,358,000
Under circular of July 19, 1890.....	17,334,830	21,225,000
Under circular of August 19, 1890.....	590,050	591,000
Under circular of August 21, 1890.....	20,660,700	20,964,000
Under circular of August 30, 1890.....	13,678,100	19,818,000
Under circular of September 6, 1890.....	(*)	12,000,000
Under circular of September 13, 1890.....	17,071,150	21,617,000
Total.....	75,628,300	98,276,000

And the annual reduction of the interest charge, with total saving interest, is shown in the following statement, viz:

	Reduction of interest charge.	Total saving.
Under circular of April 17, 1889.....	\$91,548 75	\$449,000
Under circular of July 19, 1890.....	690,449 00	7,074,000
Under circular of August 19, 1890.....	25,202 25	6,000,000
Under circular of August 21, 1890.....	902,731 50	9,000,000
Under circular of August 30, 1890.....	840,614 50	8,400,000
Under circular of September 13, 1890.....	682,846 00	7,000,000
Total since June 30, 1890.....	3,242,292 00	14,992,000
Add fiscal year 1890.....	4,234,986 25	34,046,000
Totals since June 30, 1889.....	7,577,278 25	49,038,000

It should be stated that there is no saving of interest on the 4½ per cent. bonds redeemed under the circulars of August 21 and 30, since all the interest on those bonds to September 1, 1891, the date on which they become redeemable, has been prepaid, and that the reduction of the annual interest charge on the same bonds takes effect only from that date.

Another circular inviting the surrender of 4½ per cent. bonds for redemption, with interest to and including August 31, 1891, was published October 9, 1890. The amount surrendered under that circular during the month of October was \$3,203,100.

The total amount of 4 and 4½ per cent. bonds purchased and redeemed since March 4, 1889, is \$211,832,450, and the amount expended thereon is \$246,620,741.72. The reduction in the annual interest charge on reason of these transactions is \$8,967,609.75, and the total saving of interest is \$51,576,706.01.

It will be seen from the above statement that during the three and one-third months, from July 19 to November 1, 1890, over \$99,000,000 were disbursed in payment for bonds and interest.

*Prepayment of interest.

There are many grave objections to the accumulation of a large surplus in the Treasury, and especially to the power which the control of such surplus gives to the Secretary. I am sure those objections appeal to no one with so much force as to the head of the Department upon whom rests the difficult and delicate responsibility of its administration.

In my judgment, the gravest defect in our present financial system is its lack of elasticity. The national-banking system supplied this defect to some extent by the authority which the banks have to increase their circulation in times of stringency, and to reduce when money becomes redundant; but, by reason of the high price of bonds, this authority has ceased to be of much practical value.

The demand for money, in this country, is so irregular that an amount of circulation, which will be ample during ten months of the year, will frequently prove so deficient during the other two months as to cause stringency and commercial disaster. Such stringency may occur without any speculative manipulations of money, though, unfortunately, it is often intensified by such manipulations. The crops of the country have reached proportions so immense that their movement to market, in August and September, annually causes a dangerous absorption of money. The lack of a sufficient supply to meet the increased demand during those months may entail heavy losses upon the agricultural as well as upon other business interests. Though financial stringency may occur at any time, and from many causes, yet nearly all of the great commercial crises in our history have occurred during the months named, and unless some provision be made to meet such contingencies in the future, like disasters may be confidently expected.

I am aware that the theory obtains, in the minds of many people, that if there were no surplus in the Treasury, a sufficient amount of money would be in circulation, and hence no stringency would occur. The fact is, however, that such stringency has seldom been produced by Treasury absorption, but generally by some sudden or unusual demand for money entirely independent of Treasury conditions and operations. The financial pressure in September last, which at one time assumed a threatening character, illustrates the truth of this statement. There was at that time no accumulation of money in the Treasury from customs or internal-revenue taxes, nor from any other source that could have affected the money market. On the contrary, the total disbursements for all purposes, including bond purchases and interest prepayments, during the last preceding fifty-three days, had been about \$29,000,000 in excess of the receipts from all sources.

The total apparent surplus on September 10, when the money stringency culminated, was \$99,509,220.53. Of this amount \$24,216,804.17 was on deposit in the banks, and presumably in circulation among the people, and \$21,709,379.77 was fractional silver, which had been in the Treasury vaults for several years, and was not available for any considerable disbursements. Deducting the sum of these two items, \$45,926,184.73, left an actual available surplus of only \$53,583,035.86. The amount of the bank-note redemption fund then in the Treasury which had been transferred to the available funds by the act of June 14, 1890, was \$54,000,000, being substantially the amount of the available surplus on September 10, 1890. This bank-note fund had been in the Treasury in varying amounts for many years. In August 1887, it was \$105,873,095.60, which had been gradually reduced by disbursements to the amount above named. It is apparent, therefore, that the financial stringency, under discussion, was not produced by the absorption of money by the Treasury, but by causes wholly outside Treasury operations. At the time when the financial pressure in September reached its climax, the extraordinary disbursements for bond purchases had substantially exhausted the entire ordinary Treasury accumulations, and but for the fact that Congress had wisely transferred the bank-note redemption fund to the available cash, there would have been no money at command, in the Treasury, by which the strained financial conditions could have been relieved, and threatened panic and disaster averted. Had this fund been in the banks instead of the Treasury the business of the country would have been adjusted to the increased supply, and when the strain came it would have been impossible for the banks to meet it. The Government could not have withdrawn from the banks without compelling a contraction of their loans, and thus diminishing their ability to give relief to their customers.

The more recent financial stringency in November, immediately after the disbursement of over \$100,000,000 for the purchase and redemption of bonds within the preceding four months, furnishes another forcible illustration that such stringencies are due to other causes than Treasury operations.

TARIFF AND CUSTOMS ADMINISTRATION.

In my report of last year I recommended a revision of the tariff and the adoption of better methods of customs administration. In providing for a reduction of excessive revenue by a re-arrangement of the import duties, it was advised that the opportunity be taken to remove inequalities and incongruities resulting from defective legislative

and changed conditions of trade, and which bore injuriously upon public and private interests; to simplify both rates and classification; to enlarge the free list by the addition thereto of articles unsuited to domestic production, or which were of an unprofitable or unimportant character as subjects of domestic industry, and to maintain the protective principle, and thus to stimulate and improve our home markets and give remunerative employment to our workingmen.

In the recent statutes, respectively known as the "Customs Administrative Act" and the "Tariff Act of 1890," these views have received legislative approval and sanction. The customs administrative act went into operation August 1, 1890. Four months is too short a time in which to determine fully the merits of the law, but in its operation thus far it seems to have fully justified its enactment. The just interests of the revenue and of honest importers have been promoted, and the Government has now, to a greater extent than ever before, control of the means to determine the legal rate and amount of duty due and collectible upon importations.

It is recommended that that part of section 8 of the law which requires a statement of the cost of production of consigned merchandise be repealed, as it is found to be of little practical utility, and to be obstructive to legitimate business. Also, that that part of section 19 which imposes additional duties on unusual coverings be modified so that such coverings shall pay a single duty, at the rate to which they would be subject if imported separately, not less than that imposed upon the contents.

The purpose of the tariff act of October 1 last was to effect needed reduction of revenue, and such an adjustment of duties as would adequately foster and encourage home industries while maintaining the standard of American wages. This end, it is believed, has been accomplished. More articles than ever before have been placed upon the free list, rates have been reduced on many others, and increased duties have been imposed when deemed necessary to the adequate protection of our agricultural and manufacturing interests.

The area of population, the accumulated wealth and characteristic resources of the United States, render it certain that, for many years to come, the home market will be a better one for our own products than all others combined. This very superiority of the United States as a market is an inducement to foreign producers everywhere to seek access to and control of it. To permit our own producers to be driven out by foreign competition would be to expel them from their best and most natural market, and compel them to seek inferior com-

petitive markets elsewhere. Free trade can never be successfully established or perpetuated in any country whose home market for own products exceeds its aggregate markets abroad.

The provisions for the advancement of reciprocal trade with other countries, as contemplated by the law, are not hostile to the principle of protection, but are believed to be in harmony with it.

The law has been too short a time in operation to warrant discussion herein of its many details. It is believed that the measure is sound in principle, and that its several classifications, rates, and other provisions have been adjusted upon a comprehensive view of the vast interests of the whole country. The law embraces so many and such complex interests that it is quite possible a practical test may disclose the necessity for some modifications and corrections, but stability and certainty in the revenue laws are so essential to our financial and industrial prosperity, that it is earnestly hoped this law may have a fair trial before any radical and sweeping changes shall be attempted. The new industries which it was confidently expected would spring up under its fostering care, and the new home markets which would thereby be opened for American labor and products, will certainly fail of realization if any well-grounded fear shall be aroused as to the stability of the law, or of the principle of protection which it embodies. Especially will this be the fact if the continued agitation of this question shall cause serious apprehension that the protective principle is to be discarded, and a tariff for revenue only is to be adopted, whereby our home market is to be exchanged for an uncertain and vastly inferior foreign one, and the country is to be depleted of its gold and silver to pay for foreign labor and material which should be supplied by our own people.

The continuing controversy between the American system of wisely adjusted protection, and the opposite system of unchecked industrial competition with all the world, is the inevitable contest between two irreconcilable standards of civilization. The conditions under which we are enabled to make the contest for the higher standard of living for all classes of our citizens are peculiarly favorable. The United States, with absolute freedom of trade, and perfectly untrammelled industrial competition among sixty-three millions of people, unsurpassed in energy, industry, and inventive genius, and with the widest possible range of climate and natural products, are by these conditions assured the lowest range of prices compatible with a reasonable return to producers, and the maintenance of a higher standard of civilization for the industrial classes.

I again urge certain amendments to the laws relating to the customs service, which have been heretofore recommended as essential to economical and efficient administration.

First. The increase of the permanent appropriation for the expense of collecting the revenue from customs.

For many years the fund available for defraying the expenses of collecting the revenue from customs has been insufficient to cover such expenses, and the Department has been unable to employ a sufficient force to properly collect the revenue and guard against evasions. It is false economy to refuse the means to insure the enforcement of the laws upon which depend the revenues of the Government. The Department is almost daily compelled to refuse expenditures absolutely necessary to such enforcement. On this subject the following is quoted from the Secretary's last Annual Report :

Serious embarrassments have occurred several times through deficiency in this appropriation, which has proved insufficient to defray the necessary expenses of collection, the average annual cost of which exceeds \$7,000,000.

The fund at disposal is derived from the permanent annual appropriation of \$5,500,000 made by the act of March 3, 1871, "and in addition thereto such sums as may be received from fines, penalties, and forfeitures connected with the customs, and from fees paid into the Treasury by customs officers, and from storage, cartage, drayage, labor, and services," which on the date of the passage of the act amounted to nearly \$2,000,000.

Since that time the annual receipts from these sources have diminished about \$1,000,000, in consequence of legislation affecting fines, penalties, and forfeitures, and the abolition of many of the official fees.

The rapid growth of the country, the opening of an immense line of ungarded frontier by the building of railways, and the creation of new ports, make the need of legislation on this subject more imperative than ever before.

Second. The compensation of all collectors of customs by fixed salaries, and the abolishment of all fees, commissions, perquisites, and emoluments.

This is necessary to secure uniformity and the proper adjustment of the compensation of these officers commensurate with their duties and responsibilities.

Under the present system the emoluments of some collectors are excessive while in other cases they are inadequate.

Third. The consolidation of customs districts, demanded alike for reasons of economy and the changed condition of commerce and transportation.

This might be accomplished by authorizing the Secretary of the Treasury to change the boundaries of customs districts, or to abolish districts when the expenditures exceed the receipts therein.

Fourth. The abolishment of oaths to monthly accounts of custom employes as unnecessary and as subjecting these officers to useless expense.

Fifth. The repeal of the laws requiring bonds to be given by individual importers upon the entry of merchandise for warehouse, and for the return of packages not designated for examination and delivered by importers in advance of appraisement and liquidation of duties.

In the case of warehouse bonds the Government is amply protected by the possession of the merchandise, and the so-called "return bonds" are found in practice to serve no valuable end. The taking of these useless bonds involves a large expense without any compensating benefit.

Sixth. The revision and codification of the customs laws.

These laws are now scattered through the statutes, and should be brought together, revised, and re-enacted in one harmonious code.

Seventh. Legislation to secure railway statistics of foreign commerce.

It is indispensable to a proper record and exposition of the foreign commerce of the United States that railway carriers of merchandise should be required by law to render such statistical returns as are required of carriers of freight by water.

Any attempt to completely exhibit the foreign trade of the country is largely neutralized and frustrated at present by the necessity of merely estimating the greater part of such trade conducted by rail.

General Appraisers.

The report of the General Appraisers* presents an interesting exhibit of the workings of the new law regarding appraisements for the three months ending October 31.

During that period the General Appraisers decided 779 cases of appeals on questions of value, 713 of which arose in New York and 66 at all other ports. They received during the same period 1,700 protests upon questions of classification, of which 1,129 related to importations at New York and 571 to importations at other ports. During the same time they disposed of 704 of these cases, leaving 996 pending.

It appears that the business at the port of New York alone is sufficient to require the whole number of General Appraisers now authorized by law. It would seem, therefore, that an increase in the number of this force is needed for the prompt and speedy dispatch of the additional business coming before them from the other ports.

* Not published.

The General Appraisers represent that the pay of the local appraiser at New York is inadequate, and that while he is held responsible for the proper administration of this most important department of the customs service, he is restricted by law to a nominal rather than actual control of his chief subordinates.

Their recommendation that this office be reorganized and the salary of the appraiser increased merits the early attention of Congress.

Special Agents.

The report of the Supervising Special Agent presents a summary of the work performed by this branch of the customs service.

A tabular statement is appended to said report showing the business transacted in each of the collection districts and ports, from which it appears that the percentage of cost of collection for the last fiscal year was lower than ever before.

The Supervising Special Agent was detailed to attend the conference of consuls called by the Secretary of State to meet in Paris in August last. His report indicates the valuable results expected in the greater efficiency and uniformity of practice in the consular service, and more harmonious relations between consuls and customs officers.

INTERNAL REVENUE.

The report of the Commissioner of Internal Revenue, showing in detail the operations of this Bureau, is transmitted herewith. The following summary will disclose at a glance the satisfactory condition of that branch of the public service, and the very efficient and economical manner in which it has been conducted:

The receipts from all sources of internal revenue for the fiscal year ended June 30, 1890, were.....	\$142,594,696 57
The receipts from the same sources for the fiscal year ended June 30, 1889, were.....	130,894,434 20
Making an increase in the receipts for the fiscal year just ended of.....	11,700,262 37
The total cost of collection for the fiscal year ended June 30, 1890, was.....	4,095,110 80
The total cost of collection for the fiscal year ended June 30, 1889, was.....	4,185,728 65
Making a reduction in the cost of collection for the fiscal year just ended of.....	90,617, 85

The amounts herein stated are the amounts actually collected during the fiscal years mentioned, but in many cases the money collected on the last day of June is not deposited until the first day of July, thus causing a slight discrepancy between the collections and the deposits.

The total production of distilled spirits for the fiscal year ended June 30, 1890, was 111,101,738 gallons; the total production for the fiscal year ended June 30, 1889, was 91,133,550 gallons, making an increase in the production of distilled spirits for the fiscal year just ended of 19,968,188 gallons.

The number of barrels of beer produced during the fiscal year ended June 30, 1890, was 27,561,944. The number of barrels produced during the fiscal year ended June 30, 1889, was 25,119,853, making an increased production for the fiscal year just ended of 2,442,091 barrels.

The total receipts from the taxes on tobacco, cigars, cigarettes, snuff, etc., for the fiscal year ended June 30, 1890, were \$33,958,991.06. The receipts from the same source for the fiscal year ended June 30, 1889, were \$31,866,860.42, making an increase for the fiscal year just ended of \$2,092,130.64.

During the fiscal year ended June 30, 1890, 6,211 distilleries of all kinds were in operation, while for the fiscal year ended June 30, 1889, 4,349 distilleries of all kinds were operated, making an increase in the number of distilleries operated for the fiscal year just ended of 1,862.

The quantity of spirits gauged for the fiscal year ended June 30, 1890, was 324,175,208 gallons. The quantity gauged for the fiscal year ended June 30, 1889, was 288,917,467 gallons, making an increase of the quantity of spirits gauged for the fiscal year just ended of 35,257,741 gallons.

The percentage of cost of collection for the fiscal year ended June 30, 1889, was 3.2. For the fiscal year ended June 30, 1890, the percentage of cost of collection was 2.82.

From this brief summary it appears that while the increase of business was very large in all its branches, resulting in an increase of revenue amounting to \$11,700,262.37 over the year 1889, yet there was a saving of \$90,617.85 in the actual cost of collection.

The estimated receipts from all sources of internal revenue for the current fiscal year will aggregate \$145,000,000.

This estimate has carefully kept in view the reduction made in the tax on tobacco and snuff, and the repeal of the law imposing special taxes on dealers in tobacco, manufacturers of tobacco and cigars, and peddlers of tobacco. Upon the basis of the receipts for the fiscal year ended June 30, 1890, from the various sources of internal revenue

affected by the act of October 1, 1890, the following table has been prepared, which presents in detail the estimated decrease to be expected in receipts:

Estimated reduction in receipts.

Tobacco, chewing and smoking:

Estimated receipts for six months ending December 31, 1890, tax 8 cents per pound.....	\$9,162,740 68
Estimated receipts for six months ending June 30, 1891, tax 6 cents per pound.....	6,872,055 51
Total estimated receipts from tobacco for fiscal year ending June 30, 1891.....	<u>16,034,796 19</u>
Estimated reduction in receipts from tobacco for fiscal year ending June 30, 1891.....	<u>2,290,685 17</u>

Snuff:

Estimated receipts for six months ending December 31, 1890, tax 8 cents per pound.....	368,865 63
Estimated receipts for six months ending June 30, 1891, tax 6 cents per pound.....	276,649 22
Total estimated receipts from snuff for fiscal year ended June 30, 1891.....	<u>645,514 86</u>
Estimated reduction in receipts from snuff for fiscal year ending June 30, 1891.....	<u>92,216 41</u>

Special taxes:

Dealers in leaf tobacco.....	44,492 40
Dealers in manufactured tobacco.....	1,331,118 24
Manufacturers of tobacco.....	5,197 50
Manufacturers of cigars.....	122,896 49
Peddlers of tobacco.....	<u>11,776 51</u>
Total estimated reduction in special taxes for fiscal year ended June 30, 1891.....	<u>1,515,481 14</u>

Recapitulation.

Estimated reduction in receipts from tobacco.....	2,290,685 17
Estimated reduction in receipts from snuff.....	92,216 41
Estimated reduction in receipts from special taxes.....	<u>1,515,481 14</u>

Total estimated reduction in receipts from tobacco, etc., for fiscal year ending June 30, 1891..... 3,898,382 72

The further reduction of \$450,000 may be expected under the operation of those provisions of the act of October 1, 1890, which authorize the fortification of wines with grape brandy free of tax.

It is estimated that about two million five hundred thousand gallons of wine will be fortified, and that about one-fifth of their bulk will be required in grape brandy—say five hundred thousand gallons will be used in the process, tax on which is \$450,000. This would make a total estimated reduction in receipts for the fiscal year ending June 30, 1891, aggregate \$4,348,382.72.

Increase in expenses for next fiscal year.

In connection with the estimate of expenses for the next fiscal year attention is called to the fact that section 231 of the act of October 1, 1890, provides as follows:

That on and after July 1, 1891, and until July 1, 1905, there shall be paid, from moneys in the Treasury not otherwise appropriated, under the provisions of section 231 of the Revised Statutes, to the producer of sugar testing not less than ninety degrees by the polariscope, from beets, sorghum, or sugar-cane grown within the United States, a bounty of 2 cents per pound upon such sugar testing less than ninety degrees by the polariscope, and not less than eighty degrees, a bounty of 1½ cents per pound, under such rules and regulations as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall prescribe.

It is impossible at present to make even an approximate estimate of the expenses necessary to carry into effect this provision of the law. It is believed, however, that it will require a very considerable sum of money to enable the Department to ascertain upon what sugars a bounty shall be paid, and the rate of bounty to which claimants may be entitled.

Congress also enacted a law authorizing the makers of sweet wine to use grape brandy, free of tax, for the fortification of their wines, and the Bureau has not yet been able to make an estimate of what additional sum will be required to carry into effect the provisions of this law.

The ascertaining of the amount of bounty to be paid to the producer of sugar is an entirely new feature in the internal-revenue system. The Bureau has none of the machinery required to execute the law. It is simply a collection office. It will be necessary to make a chemical analysis in all cases where bounty is claimed.

It is not deemed practical to have samples sent to this office for analysis, and rely upon the tests made here as to the entire product. The law requires that the tests shall be made by the polariscope, and this will require the services of a large number of chemists of com-

erable experience. Only one chemist and one microscopist are now employed in the Bureau of Internal Revenue. I am informed that the Department of Agriculture now employs a number of chemists, and gives much attention to the culture of sugar-producing plants and the methods of manufacturing sugar.

In view of these facts, it is respectfully recommended that the law be so amended as to require this bounty to be ascertained and paid by the Department of Agriculture.

If, however, it shall be decided that this Department shall remain charged with the duty of ascertaining and paying the bounty upon sugar, the Secretary is compelled to ask the privilege of being allowed to make a supplemental report upon these two subjects, and to ask for such additional appropriations as may be necessary to give these laws full force and effect, and to fully protect the interests of the Government in their execution.

PUBLIC MONEYS.

The monetary transactions of the Government have been conducted through the Treasurer of the United States, nine subtreasury officers, and two hundred and seventy-five national-bank depositaries. The number of such depositaries on November 1, 1890, was 204.

The amount of public moneys held by national-bank depositaries, including those to credit of the Treasurer's general account and disbursing officers' balances, on March 1, 1889, was \$48,818,991.63, which, being largely in excess of the needs of the public service, I have endeavored, as far as practicable, to reduce to the amount necessary to be kept with such depositaries for the business transactions of the Government. To accomplish this purpose, without seriously disturbing the business of the people, who may have been borrowers of these depositaries, by any sudden withdrawal of large amounts, each depositary holding any public money, in excess of that needed, was notified on November 30, 1889, to transfer to the subtreasury on or before January 15, 1890, an amount equal to 10 per cent. of the excess, or, if preferred, the whole amount could be transferred at once. This gave ample time for the adjustment of any business changes made necessary by the withdrawal of funds, and resulted in a reduction of about \$9,000,000. A similar notification was given January 28, 1890, allowing until March 1, 1890, to make the transfer, which resulted in a reduction of about \$6,000,000. No further notifications for withdrawals have yet been made, but the holdings of the depositaries have been further reduced by the purchase and redemption of United States bonds held in trust as security for deposits, and

the payment of the deposits, with these depositaries, from the proceeds of the purchases or redemptions, so that on November 1, 1890, amount held by banks was \$29,937,687.68, a reduction since March 1889, of \$18,881,303.95.

The entire amount thus withdrawn from the banks was in excess of the needs of the public service with those depositaries, and was used in payment of United States interest-bearing bonds purchased either from the banks relinquishing the deposits, or from others, and resulted in a saving to the Government, by reason of the purchase of these bonds and the consequent stoppage of interest, of about \$400,000 per annum. Such withdrawal also increased the circulation, for in no case was a bank allowed to hold public funds to the amount of the market value of the United States bonds furnished as security therefor. On four-and-a-half per cent. bonds a balance equal to par was allowed, and on four per cent. bonds a balance equal to 110 per cent. of face value; that for each \$100,000 withdrawn from the banks, payment from the Treasury was made for like amount of bonds, with premium at an average rate of 105½ for four-and-a-half per cent. and 127 for four per cent. bonds, thus returning to the channels of trade the amount of the deposit, and from \$5,000 to \$17,000 additional on each \$100,000. The increase of circulation by these operations was about \$2,000,000.

The amount now held by the national-bank depositaries is still in excess of the requirements of the public service, and further withdrawal will be made whenever it can be done without detriment to business interests.

Some of the objections, believed to be conclusive, against this method of restoring the surplus to circulation, were stated specifically in the Secretary's last annual report. Subsequent experience has confirmed the convictions then expressed, that this policy is unwise and inexpedient and should never be employed except as a last resort.

During the recent financial stringency the Secretary was frequently urged to adopt this method of reducing the surplus, but he declined to do so for the reasons stated in said report, and also for the further reason that such relief was wholly impracticable to meet a sudden emergency. The law does not permit the transfer of money, once covered into the Treasury, to banks for commercial purposes, and it specifically forbids a transfer of money received from customs duties. The only authorized method of making such deposits is to designate certain banks as depositaries of public moneys, after which they may deposit United States bonds to the amount designated, and then be authorized to receive such funds as may be thereafter collected under the internal-revenue laws.

This is necessarily a very slow process, which would require several weeks, if not months, to produce any substantial effect upon the circulation. Such a policy would certainly prove a most unsatisfactory way of affording relief to the business interests of the country in an impending commercial crisis.

There are doubtless some defects in the independent-treasury system, but an experience of forty-four years has, in my judgment, fully demonstrated its superiority to the bank-deposit policy, which it superseded. In the annual report of the Secretary of the Treasury for the year 1857 will be found a very forcible statement of the relative advantages of the two systems in their ability to meet commercial crises, as illustrated in 1837 under the bank-deposit policy, and in 1857, when the independent-treasury system was in full operation:

The operations of the independent-treasury system, in ordinary times, had been found by experience eminently successful. The danger of loss from unfaithful and inefficient officers, the expense of conducting its operations without the intervention of bank agencies, its deleterious effects upon commercial progress and the general business of the country—all of which were apprehended by the opponents of the measure at the time of its adoption—have been demonstrated to be unfounded. It only remained to encounter a commercial crisis like the present to vindicate the justice and wisdom of the policy against all cause of complaint or apprehension. A brief comparison of the operations of the Treasury Department during the suspension of 1837 and the present time will place the subject before the public mind in the most satisfactory manner.

On the 30th of June, 1837, immediately after the general suspension, the deposit books held to the credit of the Treasurer of the United States, and subject to his draft, the sum of \$24,394,154.37—a larger amount, in proportion to the receipts and expenditures of the Government, than there was in the Treasury at the time of the suspension by the banks the present year. The funds of the Government being then under the control of the banks, and they either unwilling or unable to pay, the Government was placed in the anomalous condition of having an overflowing Treasury, which it was seeking to deplete by distribution or deposits with the States, and yet unable to meet its most ordinary obligations.

* * * * *

The effort of the Government to withdraw its deposits and get control of its funds was felt as an additional blow aimed at the banks. Every dollar which could thus be drawn from the vaults of the banks diminished to that extent their ability to afford relief to their customers. Their loans had to be contracted, and the demand made by them upon their debtors for settlement increased the pressure already felt in the money market, and thereby added to the general panic and want of confidence, which are the usual attendants of a monetary crisis. The Government was not only embarrassed for want of its money, but in the effort to obtain it became obnoxious to the charge of adding to the general distress, which many persons thought it was its duty to relieve. To avoid a recurrence of these difficulties, the plan of separating the Government from all connection with the banks was suggested, and in 1846 was permanently adopted.

The result is before the country in the occurrences of the last few weeks. The banks, as in 1837, have suspended specie payments, but the analogy ceases there, so far as operations of the Treasury Department in its disbursements are concerned. The Government has its money in the hands of its own officers, and in the only currency known to the Constitution. It has met every liability without embarrassment. It has resorted to no expedient to meet the claims of its creditors, but with promptness each one upon presentation. If the contrast between the operations of 1837 and present time stopped here it would be enough to vindicate the policy of the independent-treasury system; but it does not. The most remarkable feature distinguishing the two periods has reference to the effect upon the commercial and general business interest of the country produced by the present operations of the independent treasury. It is the relief which has been afforded to the money market by the disbursement of specie of the General Government. In 1837 the demand of the Government for funds with which to meet its obligations weakened the banks, crippled their resources and added to the general panic and pressure. In 1857 the disbursements by the Government of its funds, which it kept in its own vaults, supplied the banks with and strengthened their hands, and would thus have enabled them to afford relief when was so much needed, if they had been in a condition to do it.

This item of history, and the many subsequent operations of the independent-treasury system, under like circumstances, are commended to the careful consideration of those persons who now insist upon repeal, and upon a return to the old bank-deposit policy. It is well of observation, also, that the policy of affording "relief to the money market," now so much criticized in certain quarters, is by no means a new thing. It has been the uniform policy of the Government, whenever possible, in all commercial crises from 1846 to the present time. The difficulty which the Department has encountered during the last year in withdrawing a part of our present bank deposits, even by the careful and conservative methods adopted, and at times when there was financial pressure, gives some conception of what those difficulties would be in making such withdrawals in times of stringency and commercial distress. The experiences of 1837, related in the above quotations, would be repeated, more or less, in every commercial crisis.

CIRCULATION.

The following tables exhibit the comparative amounts of the various kinds of money in actual circulation at several different periods. We have chosen the census years 1870, 1880, and 1890, because of the convenience afforded for comparing the amount of circulation with population. The various sums stated in the tables are all exclusive of money in the Treasury. They represent, as nearly as is possible, the estimated amounts of the several kinds of money in actual circulation among the people at the periods named.

REPORT OF THE SECRETARY OF THE TREASURY.

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TABLE No. 1.—Comparative statement showing the changes in circulation during twenty years from October 1, 1870, to October 1, 1890.

	In circulation October 1, 1870.	In circulation October 1, 1890.	Decrease.	Increase.
Gold coin.....	\$78,955,305 00	\$394,970,723 00		\$307,954,418 00
Standard silver dollars.....		62,132,454 00		62,132,454 00
Subsidiary silver and fractional currency.....	38,088,926 00	56,311,846 00		17,322,851 00
Gold certificates.....	28,611,699 00	158,194,739 00		129,583,739 00
Silver certificates.....		309,321,207 00		309,321,207 00
Treasury notes, act July 14, 1890.....		7,106,500 00		7,106,500 00
United States notes.....	329,480,221 00	349,903,723 00		11,413,503 00
National bank notes.....	294,337,479 00	177,250,514 00	\$117,086,965 00	
Totals.....	770,812,000 00	1,498,072,709 00	117,086,965 00	844,847,674 00

Net increase.....	\$727,760,709
Average net increase per month.....	3,032,336
Circulation per capita in 1870.....	12.978
Circulation per capita in 1890.....	23.969

TABLE No. 2.—Comparative statement showing the changes in circulation during ten years from October 1, 1880, to October 1, 1890.

	In circulation October 1, 1880.	In circulation October 1, 1890.	Decrease.	Increase.
Gold coin.....	\$261,930,920 00	\$390,930,723 00		\$128,018,803 00
Standard silver dollars.....	23,914,075 00	62,132,454 00		39,218,379 00
Subsidiary silver.....	48,358,543 00	56,311,846 00		7,943,303 00
Gold certificates.....	7,480,100 00	158,194,739 00		150,624,639 00
Silver certificates.....	12,203,191 00	309,321,207 00		297,118,016 00
Treasury notes, act July 14, 1870.....		7,106,500 00		7,106,500 00
United States notes.....	329,417,404 00	349,903,723 00		11,486,323 00
National bank notes.....	340,829,453 00	177,250,514 00	\$163,078,939 00	
Totals.....	1,022,033,685 00	1,498,072,709 00	163,078,939 00	639,117,969 00

Net increase.....	\$476,039,024
Average net increase per month.....	3,966,982
Circulation per capita in 1880.....	20.37
Circulation per capita in 1890.....	23.969

TABLE No. 3.—Comparative statement showing the changes in circulation during period from March 1, 1889, to October 1, 1890.

	In circulation March 1, 1889.	In circulation October 1, 1890.	Decrease.	Increase.
Gold coin.....	\$79,457,311 00	\$390,930,723 00		\$7,441,812 00
Standard silver dollars.....	57,381,004 00	62,132,454 00		4,750,350 00
Subsidiary silver.....	51,944,751 00	56,311,846 00		4,367,095 00
Gold certificates.....	130,210,717 00	158,194,739 00		27,984,022 00
Silver certificates.....	246,628,566 00	309,321,207 00		62,692,354 00
Treasury notes, act July 14, 1890.....		7,106,500 00		7,106,500 00
United States notes.....	317,380,505 00	349,903,723 00		32,523,218 00
National bank notes.....	220,561,165 00	177,250,514 00	\$43,710,641 00	
Totals.....	1,404,206,806 00	1,498,072,709 00	43,710,641 00	137,577,653 00

Increase of circulation per capita in nineteen months, about \$1.51.

Net increase.....	\$93,866,813
Average net increase per month.....	4,940,338

TABLE No. 4.—*Comparative statement showing the changes in circulation during period from March 1, 1885, to October 1, 1886.*

	In circulation March 1, 1885.	In circulation October 1, 1886.	Decrease.	Increase.
Gold coin.....	\$334,368,447 00	\$364,894,599 00		\$30,526,152 00
Standard silver dollars.....	40,596,187 00	65,179,793 00		24,583,606 00
Subsidiary silver.....	44,822,320 00	48,176,228 00		3,353,908 00
Gold certificates.....	112,662,299 00	24,691,897 00	\$87,970,402 00	
Silver certificates.....	111,467,354 00	95,387,112 00	16,080,242 00	
United States notes.....	237,594,194 00	210,181,935 00	27,412,259 00	
National bank notes.....	314,886,770 00	304,406,477 00	10,480,293 00	
Totals.....	1,286,740,059 00	1,264,889,561 00	21,850,498 00	53,485,376 00

Decrease of circulation per capita in 19 months, about 40 cents.

Net decrease.....	\$21,850,498
Average net decrease per month.....	1,150,500

TABLE No. 5.—*Comparative statement showing the changes in circulation during period from July 1 to October 1, 1890.*

	In circulation July 1, 1890.	In circulation October 1, 1890.	Decrease.	Increase.
Gold coin.....	\$374,896,881 00	\$246,559,723 00		\$12,543,342 00
Standard silver dollars.....	56,166,356 00	62,132,484 00		5,966,128 00
Subsidiary silver.....	54,086,743 00	56,311,848 00		2,225,105 00
Gold certificates.....	131,380,019 00	158,104,739 00		26,724,720 00
Silver certificates.....	297,219,043 00	309,321,267 00		12,102,224 00
Treasury notes, not July 14, 1890.....		7,166,522 00		7,166,522 00
United States notes.....	234,676,826 00	340,956,726 00		106,279,900 00
National bank notes.....	181,019,608 00	177,230,314 00	\$4,789,294 00	
Totals.....	1,429,718,376 00	1,498,072,709 00	4,368,494 00	72,722,827 00

Net increase.....	\$68,354,333
Average net increase per month.....	22,734,778

Table No. 1 shows that during the last twenty years the net aggregate increase of money in actual circulation among the people was \$727,760,709. Average monthly increase during that period, \$3,032,336. Per capita increase, \$3.991.

Table No. 2 shows that for the last ten years the aggregate increase has been \$476,039,024. Average monthly increase for same period, \$3,966,992. Per capita increase, \$3.592.

Table No. 3 shows that for the period of nineteen months from March 1, 1889, to October 1, 1890, the aggregate increase has been \$93,866,813. Average monthly increase on same period, \$4,940,358. Per capita increase, about \$1.50.

Table No. 4 shows that for the corresponding period of nineteen months from March 1, 1885, to October 1, 1886, the aggregate decrease in circulation among the people was \$21,850,498. Average monthly decrease for same period, \$1,150,500. Per capita decrease, about 40 cents.

Table No. 5 shows that for the period of three months from July 1 to October 1, 1890, the aggregate increase of circulation in actual use among the people was \$68,354,333. Average monthly increase for same period of three months, \$22,784,778.

These various changes in the amounts, in actual circulation among the people, were caused partly by the additions of new kinds of money, partly by the retirement of certain other kinds, and sometimes, very largely, by the policies pursued by the Treasury Department. The policy of hoarding, in order to show a very large surplus, accounts mainly for the heavy *decrease* of circulation shown from March, 1885, to October, 1886. The opposite policy of keeping the surplus as low as practicable by the purchase of United States bonds, and thereby saving interest, and at the same time returning the money to the channels of trade, largely accounts for the remarkable increase in circulation during the last nineteen months, as shown in tables Nos. 3 and 5.

This fact will be more readily understood by the statement that from March 4, 1885, to October 1, 1886, the total amount disbursed in redemption of bonds was \$79,026,200, while for a corresponding period from March 4, 1889, to October 1, 1890, the total amount disbursed in the redemption and purchase of bonds was \$239,799,091.

SILVER.

In my last annual report, I presented, for the consideration of Congress, a plan for the utilization of the silver product of the United States.

The measure proposed was briefly this: To purchase, at the market price, the silver bullion product of our mines and smelters, and to issue, in payment, legal tender notes, redeemable in a quantity of silver bullion equivalent in value, at the date of presentation, to the face of the notes, or in gold, at the option of the Government, or in silver dollars, at the option of the holder.

This measure was suggested with a view to promote the joint use of gold and silver as money, to increase the volume of paper currency by the annual addition of an amount equal to the value of our silver product, to provide a home market for the American product of silver, and, by so doing, enhance the value of that metal, until a point were reached where we could with safety open our mints to the free coinage of both metals at a fixed ratio.

A bill embodying, with some modifications, the measure suggested was favorably reported in the House of Representatives of the Fifty-first Congress from the Committee on Coinage, Weights, and Measures, and was adopted by the House.

The bill was amended in the Senate by the substitution of a different coinage measure.

As the result of a conference between the two bodies, a bill was passed and approved by the President, July 14, 1890, the essential provisions of which are: The monthly purchase by the Government of 4,500,000 ounces of silver, at the market price, to be paid for in legal tender notes, redeemable in coin, and the repeal, after July 1, 1891, of the mandatory coinage of silver dollars.

The material points of difference between the measure recommended and the one adopted by Congress, are that the new silver law limits the purchases of silver to 4,500,000 ounces per month, without distinction as to domestic and foreign production, instead of taking the entire silver bullion product of the United States as proposed, and omits the bullion redemption feature.

Immediately on the passage of the law new forms of legal-tender notes were designed, in denominations of one, two, five, ten, twenty, fifty, one hundred, and one thousand dollars, and were engraved and printed at the Bureau of Engraving and Printing. Owing to the fact that the purchases under the act were to commence thirty days after its passage, it was necessary that the larger denominations of notes should be engraved first, but, at this time, a sufficient supply of the smaller denominations of notes are being received, and it will be the policy of the Department to pay out small notes, as far as practical in the purchase of silver.

Regulations were also prepared inviting offers for the sale of silver for consideration at the Treasury Department, at 1 o'clock p. m., Mondays, Wednesdays, and Fridays of each week, and the effort has been to distribute the purchases as nearly as possible throughout the month.

Under the operations of this law, the amount of silver purchased from August 13, 1890, to December 1, 1890, aggregated 16,778,300 fine ounces, costing \$18,671,075, an average of \$1.1128 per fine ounce.

The price of silver advanced rapidly after the passage of the new law; indeed, the immediate effect of the law had been largely anticipated in the advance in price prior to its passage.

On the 1st of July, 1890, the price of silver was \$1.04 $\frac{6}{10}$. To July 14, the price had advanced to \$1.08; to August 13, \$1.13, and to September 3, \$1.21, the highest point reached.

Since that date there has been a decline, with some fluctuations, to the present time, the price falling as low as \$0.97.

Notwithstanding the fact that the advance in the price of silver following the passage of the law has not been maintained, the Secretary

ventures to express the belief that the new silver act is a great improvement over the law repealed, and that its beneficial results will eventually commend it to general approval. As yet the period of time has been too brief to really test the merits of the law, and the permanent effect which it will have on the price of silver.

One thing is certain, that it has been the means of providing a healthy and much-needed addition to the circulating medium of the United States.

The amount of Treasury notes issued on purchases of silver bullion from August 13 to November 23, 1890, has been \$18,807,000.

It must be apparent to any careful observer of the movement of silver, that the recent violent fluctuations in price are mainly due to speculative operations in the large surplus of from eight to ten million ounces, which has not been absorbed by Treasury purchases. This downward tendency has been materially assisted by a severe and almost constant stringency of the money market. This surplus was accumulated, in the first instance, by the withholding from the market, by producers and speculators, for some months prior to the passage of the new silver act, of the current product of American silver, in the hope of securing a better price. It has been maintained and augmented both by importations of foreign silver and by a falling off in the export of domestic silver, the latter occasioned doubtless by the fact that in the purchases of silver under the new silver law, the Treasury Department has paid, as a rule, a price considerably in excess of the price of silver in London. The imports into the United States of foreign silver from May 1 to November 1 of the present year have exceeded the exports of domestic silver by some \$7,750,000, while, for the corresponding period of last year, the exports exceeded the imports by some \$7,860,000, a difference of \$15,610,000, an amount in excess of the value of the present visible stock of silver on the American market. So, too, in regard to the movement of silver from San Francisco to the Orient; not one ounce of silver bullion has been shipped since the first of May, against an average export for prior years of from \$5,000,000 to \$10,000,000. So that the present surplus stock of silver may, at any time, be augmented by imports or diminished by exports, and, as the current product of silver from our mines does not differ very widely from the monthly purchases by the Government, it is probable that the existing surplus will remain for some time an impediment to the permanent and steady advance of silver. Even if the present surplus should be purchased by the Government, importations from abroad might, at any time, accumulate an additional stock of silver, the manipulations of which by

speculators would result in wide fluctuations in price. Had the law provided for the purchase of only the product of the United States, this surplus would have been absorbed ere this, and as none would have been imported for speculative purposes no surplus would have been accumulated. The withdrawal of the entire silver product of our mines and smelters, which amounts to nearly one-half of the world's annual output of silver, would probably soon create a shortage abroad, and this in turn would cause a steady and permanent advance in price.

PRECIOUS METALS.

Deposits and purchases.

The value of the gold deposited at the mints and assay offices, during the fiscal year, 1890, was \$49,228,823.56, of which \$6,565,728.30 were re-deposits.

Of the gold deposited, \$30,474,900.25 was the product of our own mines; \$7,990,706.22, foreign coin and bullion; \$655,474.96, light-weight domestic gold coin; and \$3,542,013.83 old material.

The silver received aggregated 37,438,788.17 standard ounces, of the coining value of \$43,565,135.15, including re-deposits, \$790,982.83 standard ounces, of the value of \$920,416.38.

Of the silver received, 32,430,150.84 standard ounces, of the coining value of \$37,736,902.64, were classified as of domestic product; 2,057,950.60 standard ounces, of the coining value of \$2,394,706.15, as foreign silver bullion; 1,056,846.28 standard ounces, of the coining value of \$1,229,784.75, as foreign silver coin; 511,228.22 standard ounces, of the coining value of \$594,883.74, as uncurrent domestic coins; 6,884.32 standard ounces, of the coining value of \$8,010.84, as trade dollars; and 584,745.08 standard ounces, of the coining value of \$680,430.65, as old material.

Coinage.

The coinage of the mints, during the fiscal year, was the largest in the history of the mint in this country, aggregating 112,698,071 pieces, valued as follows:

Gold	\$22,021,748 50
Silver dollars	35,923,816 00
Subsidiary silver	892,020 70
Minor coins	1,416,851 73
Total	80,254,436 93

Bars.

In addition to the coinage, gold bars were manufactured of the value of \$23,342,433.34, and silver bars of the value of \$7,045,357.80, a total of \$30,387,791.14.

Gold bars were exchanged for gold coin, under the provisions of the act of May 26, 1882, of the value of \$16,357,677.70.

Purchases of silver.

The amount of silver purchased, during the fiscal year, for the coinage of silver dollars was 30,912,111.17 standard ounces, costing \$26,899,326.33, an average cost of \$0.96,68 per fine ounce.

The total amount of silver purchased under the act of February 28, 1878, to August 12, 1890, the date the new silver law went into effect, aggregated 323,635,576.19 standard ounces, costing \$308,199,261.71, an average of \$1.05,8 per fine ounce.

The amount of silver purchased under the act of July 14, 1890, from August 13, the date it went into effect, to October 31, 1890, was 12,281,145.86 fine ounces, costing \$14,043,221.80, an average of \$1.14,349 per fine ounce.

The net seigniorage on the coinage of silver, during the twelve years ended June 30, 1890, including the balance in the coinage mints on July 1, 1878, has been \$65,698,057.41.

Price of silver.

The price of silver in London, at the commencement of the fiscal year, was 42 pence, and, at the close, 47½ pence, an advance of 5½ pence, equivalent to 12.6 cents per fine ounce.

The average price, during the year, was \$0.96,883 per fine ounce.

Since the close of the fiscal year, the fluctuations in price have covered a wide range. To July 14, the date of the passage of the new silver law, the price had risen in London to 49½ pence and in New York to \$1.08 per fine ounce. On August 13, the date the new silver law went into effect, the price in London had reached 51½ pence and in New York \$1.13 per fine ounce.

The highest price in London was reached, September 3, viz., 54½ pence, equivalent, at the par of exchange, to \$1.19½ per fine ounce, and in New York, on September 19, when silver touched \$1.21 per fine ounce. The present price is \$1.065.

Imports and exports.

The loss of precious metals by net export, during the year, was:

Gold.....	\$4,253,047
Silver.....	8,545,455

Product of gold and silver.

The mines of the United States yielded, during the calendar year 1889, precious metals as follows:

Gold:	
Value.....	\$32,800,000
Silver:	
Fine ounces.....	50,000,000
Commercial value.....	\$46,750,000
Coining value.....	\$64,648,464

The product of gold and silver in the world is estimated to have been for the same year:

Gold.....	\$121,162,000
Silver.....	{ Commercial value..... 116,674,000
	{ Coining value..... 161,318,000

World's coinage.

The coinage of the world, during the calendar year 1889, as far as reported, was:

Gold.....	\$168,901,519
Silver.....	135,602,064

Metallic stock.

The stock of gold and silver in the United States, on November 1, 1890, is estimated to have been \$1,180,236,177, of which \$694,865,680 consisted of gold coin and bullion, \$380,988,466 of standard silver dollars, \$77,145,591 of subsidiary silver coin, and \$27,236,440 of silver bullion.

Industrial consumption.

The value of the precious metals used in the United States in the industrial arts was, for the calendar year 1889, gold, \$16,697,000, and silver, \$8,767,000, of which \$9,686,827, gold, and \$7,297,933, silver, were domestic bullion.

Legislation.

The attention of Congress is respectfully requested to the act of May 26, 1882, authorizing the exchange of gold bars for gold coin, free of charge, at the coinage mints and at the United States assay office at New York. I am of the opinion that this act has facilitated the movement of gold from this country, and have the honor to recommend its repeal, or that it be so modified as to make the exchange of gold bars for gold coin discretionary with the Treasury Department, and to allow

the imposition of a small charge equivalent to the cost of manufacturing the bars, when the bars are intended for export.

Legislation is also recommended looking to the re-coinage of the subsidiary silver coins in the Treasury. There were on October 25, 1890, subsidiary silver coins in the Treasury of the face value of \$19,545,362.71, of which some \$600,000 were actually uncurrent, and a considerable portion of the remainder consisted of coins no longer authorized to be issued.

Of the balance, the large sum of \$17,427,663.50 consisted of half-dollars, for which there is no demand.

If authority of law existed for the recoinage of these coins into new coins of denominations for which there is a popular demand, it is believed that the very large cash asset of \$19,000,000, at present unavailable, could be made an available asset.

Aside from the importance of relieving the Treasury from this incubus of uncurrent coin, it is the duty of the Government to see that the people are provided with a suitable amount of change money in an attractive and desirable form. Instead of waiting for small annual appropriations to accomplish this desirable end, it seems eminently proper that authority should be granted the Treasury Department to recoin this uncurrent silver coin into new coin, and to pay the loss incident to such recoinage from the very large profits which have been made by the Government on the manufacture and issue of silver coins. I can conceive of no good reason for hoarding, in the Treasury vaults, nineteen millions of useless coin, which the people will not accept, and denying to them the use of this large amount of money in a form very much needed. A bill was favorably reported from the Committee on Coinage, Weights, and Measures of the Fifty-first Congress, and is now on the House Calendar, authorizing such recoinage, and I have the honor to respectfully urge its prompt and favorable consideration.

On February 18, 1890, a communication was addressed to the chairman of the Committee on Public Buildings and Grounds of the House of Representatives, recommending the passage of the bill for the sale of the present site and the purchase of a new site and the erection of a suitable building for the mint at Philadelphia. The bill was favorably reported from the Committee on Public Buildings and Grounds, and is now on the House Calendar, and it is recommended that it be enacted into law at the present session of Congress.

NATIONAL BANKS.

The report of the Comptroller of the Currency contains full information in reference to the affairs of national banks, and covers the opera-

tions of the Bureau for the twelve months ended October 31, 1890. During this period 307 new associations have been organized, 50 have gone into voluntary liquidation, and 9 have been placed in the hands of receivers. The net increase is 248, constituting a larger growth than during any similar period since 1865. The number of active banks on October 31, 1890, was 3,567, which is an increase over any previous date.

These banks have in capital stock \$659,782,865; bonds deposited to secure circulation, \$140,190,900; and bank notes outstanding \$179,755,643, including \$54,796,907, represented by lawful money deposited to redeem circulation still outstanding. The gross decrease in circulation during the year, including notes of gold banks, and those of failed and liquidating associations, was \$22,267,772, and the decrease in circulation secured by United States bonds was \$5,248,549.

On October 2, 1890, the date of the last report of condition, 3,540 banks were opened for business. These associations report an aggregate capital of \$650,447,235; surplus, \$213,563,895; and undivided profits \$97,006,636. Gross deposits, including amounts due banks, are stated at \$2,023,502,067; loans and discounts, \$1,970,022,687; an increase in each of these items over any previous date. They held \$195,908,853 in specie; \$80,604,731 in legal-tender notes; \$18,492,392 in national bank notes, and \$6,155,000 in United States certificates of deposit.

Accessions to the system have been most numerous in the States west of the Mississippi River, Texas being most prominent, with 63 new associations.

The Comptroller again calls attention to the fact that the issue of circulating notes has become unremunerative, on account of the high premium commanded by the bonds of the United States, and renew his recommendations of last year, in which I concur, that the obligatory deposit of bonds be reduced, that circulation be issued equal in amount to the par value of the bonds pledged, and that the semi-annual duty thereon be fixed at one-fourth of one per centum per annum. He also asks that Congress provide for the semi-annual publication of the detailed reports of national banking associations.

Reports received and tabulated show that drafts were drawn by 3,321 national banks upon their correspondents during the year ended June 30, 1890, aggregating \$11,550,898,255, at an average cost to the purchaser of $8\frac{1}{2}$ cents premium on each one hundred dollars. An estimate of the amount of drafts drawn by other banks and bankers is also submitted, from which it would appear that the domestic exchange drawn by banking institutions in the United States during the last fiscal year aggregated \$17,927,524,760.

The Comptroller has obtained and published returns exhibiting the proportion of coin, paper money, checks, and drafts used in banking operations, as shown by detailed statements of the receipts of the national associations on July 1 and September 17, 1890.

For the first date reports were received from 3,364 national banks. Their total receipts on that day were \$421,824,726. Of this sum \$3,726,606 was in gold coin, \$1,352,647 in silver coin, \$6,427,973 in gold Treasury certificates, \$6,442,638 in silver Treasury certificates, \$7,881,786 in legal tender Treasury notes, \$5,244,967 in national bank notes, \$520,000 in United States certificates of deposits for legal-tender notes, \$189,408,708 in checks, drafts, certificates of deposit, and bills of exchange, \$4,391,177 in clearing-house certificates, \$194,290,203 in exchanges for clearing-houses, and \$2,138,022 in miscellaneous items. Of the total receipts 7.50 per cent. consisted of coin and paper money, and the remainder, 92.50 per cent., was in checks, drafts, and other substitutes for money.

The total receipts of 3,474 national banks for September 17, 1890, is stated at \$327,278,251, of which coin and paper money constituted 8.96 per cent., and checks, drafts, etc., 91.04 per cent. The falling off in total receipts on the latter date is due to the severe stringency in the money market then prevailing.

Similar statistics were procured in 1881. A comparison shows that a larger proportion of coin and paper money enter into banking operations in 1890 than in 1881. These percentages for the two days in 1881 are 4.87 and 5.91 respectively; in 1890, for similar dates, 7.50 and 8.96 per centum. The increased use of money here shown is deemed significant, when considered in connection with the present apparent insufficiency in the amount of coin and paper money in circulation.

Aside from the right to issue circulating notes the national banking system seems to be more favorably regarded than heretofore, and is rapidly extending its sphere of operations. The transactions of the year have been attended by a more than average degree of success.

ENGRAVING AND PRINTING.

The work of the Bureau of Engraving and Printing during the past year has been satisfactorily performed. The Bureau was able to meet all demands upon it, every sheet of securities and stamps actually needed in the work of the Department being furnished. The new Treasury notes authorized by act of July 14, 1890, have been promptly furnished, the denominations of \$100 and \$1,000 being ready for issue thirty days from the passage of the act, and the other denominations following as rapidly as possible thereafter. The preparatory work on the new wing

of the building is being pushed forward with all possible dispatch, and will be completed and fitted up for the occupancy of the Bureau on an early day. This will greatly relieve the present over-crowding of the employes. There is still needed, to make the facilities for the execution of the Bureau's work complete, an out-building for the accommodation of the ink mills, laundry, carpenter-shop, stable, and storeroom. The necessity for this additional building has heretofore been called to the attention of Congress, and I recommend that an appropriation be made at this session for its erection.

FOREIGN COMMERCE.

The value of our foreign commerce during the last fiscal year was greater than for any previous year. It amounted to \$1,647,139,0 as against \$1,487,533,027 during the fiscal year 1889, an increase of \$159,606,066.

The value of imports of merchandise also during the last fiscal year was the largest in the history of our commerce, amounting to \$789,310,409, as against \$745,131,652 during the fiscal year 1889, an increase of \$44,178,757.

The value of exports of merchandise during the same period was \$857,828,684, as against \$742,401,375 for the previous year, 1889, an increase of \$115,427,309.

The exports exceeded the imports of merchandise by \$68,518,2

The exports of domestic merchandise were \$115,011,219 in excess of the value of such exports during the preceding year. The greater portion of the increase occurred in the following articles, stated in order of magnitude of increase: Provisions, breadstuffs, raw cotton, iron and steel and manufactures of, vegetable oils, unmanufactured tobacco, and wood and manufactures of. This increase was in the following articles: Breadstuffs, \$31,049,266; provisions, \$32,142,0 cattle and hogs, \$15,196,492; and raw cotton, \$13,193,522; a total of \$91,581,349.

The value of the imports and exports of merchandise and specie during the last three fiscal years has been as follows:

Merchandise.

	1888.	1889.	1890.
Exports—			
Domestic	\$683,862,104	\$730,282,699	\$845,29
Foreign	12,092,403	12,118,766	12,63
Total	695,954,507	742,401,375	857,92
Imports	723,957,114	745,131,652	789,31
Excess of exports			68,51
Excess of imports	28,002,607	2,730,277	

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Specie.

	1888.	1889.	1890.
Exports—			
Gold.....	\$18,376,134	\$59,952,285	\$17,274,491
Silver.....	28,037,949	36,689,248	34,873,929
Total.....	46,414,183	96,641,533	52,148,420
Imports—			
Gold.....	43,934,317	10,284,858	12,943,342
Silver.....	15,403,669	18,678,215	21,032,984
Total.....	59,337,986	28,963,073	33,976,326
Excess of exports.....	12,923,803	67,678,460	18,172,094
Excess of imports.....			

The following table shows the distribution of the greater portion of our commerce by countries, continents, and grand divisions of the globe.

Countries and grand divisions.	Exports.			Imports.	Total exports and imports.	Excess of exports + and of imports —.
	Domestic.	Foreign.	Total.			
COUNTRIES.	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>
Great Britain and Ireland.....	444,459,009	3,426,653	447,885,662	186,488,956	634,384,618	+261,406,706
Germany.....	84,315,215	1,248,097	85,563,312	98,837,683	184,400,995	-13,274,371
France.....	49,013,004	964,020	49,977,021	77,672,311	127,649,335	-27,695,287
West Indies.....	32,183,671	1,013,551	33,197,222	78,004,241	111,201,463	-44,807,019
British North American Possessions.....	38,544,454	2,969,358	41,503,812	39,396,980	80,900,792	+2,106,832
Brazil.....	11,902,496	69,718	11,972,214	59,818,756	71,290,970	-47,346,542
Netherlands.....	22,487,588	170,207	22,657,795	17,029,233	39,687,028	+5,628,562
Mexico.....	12,666,108	019,179	12,685,287	22,690,915	35,376,202	-9,403,623
Belgium.....	26,140,377	490,067	26,630,444	9,336,482	35,966,926	+17,233,962
Italy.....	12,974,249	93,847	13,068,096	20,330,051	33,308,147	-7,261,955
All other countries.....	110,607,657	1,470,159	112,077,816	180,204,801	292,282,617	-68,126,985
Total.....	845,293,828	12,534,856	857,828,684	789,310,409	1,647,139,093	+68,518,275
GRAND DIVISIONS.						
Europe.....	677,284,365	6,452,032	683,736,397	449,987,266	1,133,723,663	+233,749,131
North America—						
British North American Possessions.....	38,544,454	2,969,358	41,503,812	39,396,980	80,900,792	+2,106,832
Miquelon, Langley, and St. Pierre Islands.....	446,844	16,299	463,143	37,295	500,438	+425,848
Mexico, Central American States, and British Honduras.....	18,118,947	817,286	18,936,233	30,930,190	49,866,423	-11,993,957
West Indies.....	32,183,671	1,013,551	33,197,222	78,004,241	111,201,463	-44,807,019
Total North America.....	89,293,916	4,806,494	94,100,410	148,368,706	242,469,116	-54,268,296
South America.....	37,745,002	1,007,646	38,752,648	90,006,144	128,758,792	-61,253,496
Asia and Oceania.....	35,920,452	236,637	36,157,089	95,863,401	132,020,490	-59,706,312
Africa.....	4,590,127	23,575	4,613,702	3,321,477	7,935,179	+1,292,226
All other countries.....	459,966	8,472	468,438	1,763,415	2,231,853	-1,294,977
Total.....	845,293,828	12,534,856	857,828,684	789,310,409	1,647,139,093	+68,518,275

It will be seen that our total trade in merchandise with Great Britain and Ireland amounted to \$634,384,618, of which the value of exports was \$447,895,662, and the value of imports, \$186,488,956, showing an excess in exports of \$261,406,706. Our trade with Germany showed an excess of imports of \$13,274,371; with France, of \$27,695,287.

In our total trade with Europe the excess of exports over imports was \$233,749,131.

Our commerce in merchandise with North America, including Mexico, Central America, and West Indies, amounted to \$242,469,116, of which the value of the imports was \$148,368,706, and of the exports \$94,100,410, an excess of imports of \$54,268,296.

Our total trade with South America in merchandise amounted to \$128,758,792, of which the value of the imports was \$90,006,144, and of the exports, \$38,752,648, an excess of imports of \$51,253,496.

Exports.

The total value of exports of domestic merchandise was \$845,293,841, an increase of \$115,011,219 over the preceding year, and was greater than that of any year except 1881.

The material increase or decrease in value of the principal articles of export was as follows:

Increase.

Provisions.....	\$32,077,117
Breadstuffs.....	31,040,208
Animals.....	15,263,323
Cotton, unmanufactured.....	13,193,522
Iron and steel, and manufactures of.....	4,386,131
Vegetable oil.....	4,086,658
Tobacco leaf.....	2,578,488
Leather, and manufactures of.....	1,691,141
Mineral oil, crude.....	1,661,103
Carrriages and cars.....	1,656,157
Wood, and manufactures of.....	1,355,824

Decrease.

Hops.....	\$1,713,361
Copper ore.....	1,465,022
Clover seed.....	1,348,549
Fruits, including nuts.....	1,012,037

There was an increase in the value of domestic exports—

To the United Kingdom.....	\$64,468,678
To Germany.....	17,746,520
To France.....	3,902,012
To South America.....	4,090,678
To West Indies.....	2,242,146
To Mexico.....	1,779,820

And a decrease—

To British North American provinces.....	\$1,262,238
To British Australia.....	1,084,068

The value of the principal articles of domestic exports during the three years ending June 30, 1890, was as follows:

	1888.	1889.	1890.
Cotton, and manufactures of.....	\$236,029,949	\$247,987,914	\$290,908,069
Breadstuffs.....	127,191,887	123,876,601	154,923,977
Provisions, comprising meat and dairy products.....	93,058,080	104,122,444	136,264,506
Oils, mineral.....	47,042,469	49,913,677	514,030,089
Animals.....	12,889,660	18,374,805	33,638,123
Wood, and manufactures of.....	23,063,108	20,910,672	28,274,529
Iron and steel, and manufactures of, including iron ore...	17,768,928	21,156,100	25,542,308
Tobacco, and manufactures of.....	25,514,341	22,602,608	26,355,601
Leather, and manufactures of.....	9,583,411	10,747,710	12,438,947
Oil-cake and oil-cake meal.....	6,423,930	6,987,912	7,990,926
Coal.....	6,205,380	6,690,479	6,850,088
Chemicals, drugs, dyes, and medicines.....	5,603,972	5,542,763	6,224,504
Copper ore.....	5,064,687	7,518,258	6,063,236
Fish.....	4,177,630	5,009,285	6,040,825
Furs, and fur-skins.....	4,777,246	5,031,435	4,661,994
Spirits of turpentine.....	3,680,106	3,777,525	4,590,931
Fruits, including nuts.....	3,510,208	5,071,584	4,052,547
Total.....	631,599,762	672,231,841	775,297,806
Value of all domestic exports.....	683,882,104	730,282,609	845,298,828
Per cent. of enumerated articles to total.....	92.4	92.1	91.7

The value of the domestic exports during the two years ending June 30, 1890, classified by groups according to character of production, was as follows:

	1889.		1890.	
	Values.	Per cent.	Values.	Per cent.
Products of agriculture.....	\$532,141,430	73.87	\$629,830,806	74.51
Products of manufacture.....	138,676,567	18.09	151,102,376	17.87
Products of mining (including mineral oils).....	19,947,518	2.73	22,267,755	2.64
Products of the forest.....	26,997,127	3.70	29,478,084	3.49
Products of the fisheries.....	7,106,228	.97	7,458,385	.88
Other products.....	6,414,579	.74	5,141,420	.61
Total.....	730,282,609	100.00	845,298,828	100.00

Imports.

The total value of the imports was \$780,310,409, an increase of \$44,178,757 over the preceding year, of which the sum of \$9,181,551 represents free merchandise, and \$34,997,206 dutiable merchandise.

The material increase or decrease in value of the principal classes of imports was as follows:

Increase.	
Free of duty:	
Silk, unmanufactured.....	\$4,998,638
Coffee.....	3,542,550
India rubber and gutta-percha, crude.....	2,467,351
Dutiable:	
Sugar, molasses, etc.....	8,484,839
Tobacco, and manufactures of.....	7,099,464
Wool, manufactures of.....	4,017,490

Dutiable—Continued.

Cotton, manufactures of	\$3,112,
Flax, hemp, jute, etc., manufactures of	2,715,
Vegetables	2,145,
Wood, and manufactures of	1,761,
Chemicals, drugs, dyes, and medicines	1,758,

*Decrease.**Free of duty:*

Hides and skins, other than fur-skins	3,245,
Paper stock, crude	663,

Dutiable:

Wool, unmanufactured	2,710,
Barley	2,063,
Flax, jute, etc.	2,091,
Rice	903,
Seeds, not medicinal	807,

There was an increase in the value of our imports as follows:

From Germany	\$17,095,237
From Great Britain and Ireland	8,219,889
From France	8,105,693
From Netherlands	6,078,390
From Japan	4,415,332
From Italy	2,337,902
From Spanish West Indies	2,017,221
From Austria-Hungary	1,689,081
From Mexico	1,437,314

And a decrease as follows:

From British North American Possessions	3,612,493
From British Australasia	1,720,535
From Uruguay	1,232,061
From British West Indies	1,120,544
From Brazil	1,085,048

Imports entered for consumption.

The value of imported merchandise entered for consumption and the duty collected thereon, during the last five fiscal years, has been as follows:

Year ending June 30—	Value of merchandise.		Duty collected.	Average rate collected.	
	Free of duty.	Dutiable.		Dutiable.	Free of duty.
				<i>Per cent.</i>	<i>Per cent.</i>
1885	\$192,912,234	\$386,667,829	\$177,319,650	45.86	54.14
1886	241,530,759	413,778,035	188,379,397	45.55	54.45
1887	233,093,659	450,325,322	213,032,421	47.19	52.81
1888	244,104,892	468,143,774	213,809,862	45.63	54.37
1889	236,374,630	484,856,768	218,701,774	45.13	54.87
1890	266,102,778	507,571,794	225,622,304	44.45	55.55

TRADE WITH CENTRAL AND SOUTH AMERICA.

Our total imports of merchandise from Mexico, Central and South American States, British Honduras, and the West Indies, during the fiscal year 1890, amounted to \$198,940,575, or 25.20 per cent. of our total imports of merchandise.

The value of our exports of merchandise to these same countries during the same period was \$90,886,103, or 10.59 per cent. of the value of our total exports of merchandise.

Our total imports and exports of merchandise from and to these countries, during the same period, amounted to \$289,826,678, or 17.6 per cent. of our total imports and exports of merchandise.

It will be seen that the excess of our imports of merchandise from these countries over our exports to them amounted to \$108,054,472. In other words, our imports of merchandise were 68.63 per cent. and exports 31.37 of the total trade with these countries, and we imported merchandise to the value of \$2.18 for every dollar in value exported to these countries.

The excess of imports over exports of merchandise for the fiscal year 1889 was \$117,917,883. For the fiscal year 1888 this excess was \$109,120,785.

The following table shows the value of imports and exports of merchandise in the trade of the United States with Mexico, Central America, the West Indies, and South America, and the excess of imports or of exports, during the years ending June 30, 1888, 1889, and 1890.

Countries from which imported and to which exported.	1888.					1889.					1890.				
	Imports.	Exports, domestic and foreign.	Excess of imports.	Excess of exports.	Imports.	Exports, domestic and foreign.	Excess of imports.	Excess of exports.	Imports.	Exports, domestic and foreign.	Imports.	Exports, domestic and foreign.	Excess of imports.	Excess of exports.	
Mexico.	\$17,329,889	\$9,897,772	\$7,432,117	\$142,859	\$21,288,601	\$11,486,496	\$9,766,705	\$158,133	\$22,690,915	\$13,285,287	\$22,690,915	\$13,285,287	\$9,405,628	\$167,637	
British Honduras	183,635	328,494			211,465	392,598			186,881	351,468					
Central American States—															
Guatemala.....	2,587,467	916,861	1,668,606		2,846,686	694,701	1,351,984		2,281,681	1,345,719			935,962		
Nicaragua.....	1,496,171	1,227,022	269,149		1,747,246	1,093,687	753,559		1,635,690	1,873,019			237,329		
Costa Rica.....	1,028,979	1,083,621	54,642		1,442,365	983,164	459,201		1,676,711	1,126,179			550,541		
Salvador.....	1,472,430	647,588	824,842		1,692,162	701,196	990,966		1,453,868	899,546			554,323		
Honduras.....	1,509,631	660,575	849,056		1,215,561	637,175	578,386		984,404	552,024			432,380		
Total	7,623,878	4,295,386	3,327,792		8,414,019	4,325,923	4,088,096		8,632,444	5,290,478			3,341,966		
West Indies—															
Cuba and Porto Rico.....	53,771,570	12,023,178	41,748,392		66,887,996	13,916,242	41,221,754		57,855,217	15,381,033			42,474,184		
British West Indies.....	12,590,940	7,611,523	4,979,417		13,985,562	8,988,106	5,007,456		14,805,018	8,283,786			6,521,232		
All other.....	6,283,156	8,234,391	2,951,235		6,123,775	8,535,805	2,412,030		5,284,096	9,526,483			4,242,477		
Total	71,645,666	27,869,102	43,696,564		77,947,333	30,840,153	47,107,180		78,004,241	33,197,222			44,807,019		
South America—															
Colombia.....	4,398,258	5,023,889	7,012,785		4,293,519	3,821,017	442,502		3,575,283	2,395,809			1,179,474		
Venezuela.....	10,161,250	8,038,515		630,622	10,392,969	3,738,591	6,653,068		10,966,703	4,025,883			6,940,820		
Guianas:															
British.....	2,822,382	1,717,411	1,104,971		4,598,181	1,666,269	2,931,912		4,326,975	2,100,345			2,226,630		
Dutch.....	481,983	596,245	164,758		401,243	292,573	108,668		674,114	270,819			403,295		
French.....	12,434	146,707		134,273	13,866	147,732		134,866	17,647	160,933			143,286		
Total Guianas	3,316,799	2,460,363	856,428		4,999,730	2,105,576	2,894,154		4,918,736	2,546,707			2,372,029		
Brazil	53,710,234	7,137,099	46,573,135		60,463,804	9,851,681	51,052,723		50,318,766	11,972,214			38,346,552		
Uruguay.....	2,711,551	1,499,952	1,211,599		2,996,984	2,192,848	794,136		2,401,697	3,851,871			1,450,174		
Argentine Republic.....	6,402,159	6,613,633		741,384	6,454,618	6,203,526	251,092		8,497,477	8,226,594			270,883		
Chile.....	8,894,520	2,433,221	6,461,299		9,622,625	2,973,794	6,648,831		8,183,219	3,226,594			4,956,625		

Bolivia.....	29,599	29,599	2,193	6,839	57,114,035	4,719	80	11,003	10,973
Peru.....	870,171	801,131	314,023	780,835	117,917,853	605,803	851,605	1,437,301	1,078,605
Ecuador.....	813,636	805,092	666,005	730,311	117,917,853	61,306	595,060	719,208	180,149
Total South America.....	84,365,395	54,777,171	92,135,032	35,021,017	57,114,035	.....	90,003,144	38,752,648	51,283,496
Total of group.....	181,058,006	109,120,785	190,961,470	82,043,687	117,917,853	.....	196,940,575	90,895,103	108,054,473
Total of imports and ex- ports from and to all countries.....	723,937,114	23,002,607	745,131,652	742,401,375	2,730,377	.....	789,310,409	397,828,684	69,519,375
Per cent. of above group.....	25.01	10.38	26.84	11.06	.....	.....	26.30	10.59	.....

A comparison of our commerce with the entire group of countries for the years 1870, 1880, and 1890, shows a gradual increase of both imports and exports of merchandise.

During the year 1870 the value of imports was \$117,398,951 and of exports \$55,140,322, an excess of \$62,258,629.

During the year 1880 the value of imports was \$178,985,906 and of exports \$61,546,474, an excess of \$117,439,432.

The per cent. of our commerce with these countries, as compared with our total commerce, in 1870, was 20.82; in 1880, 15.99; and in 1890, 17.60.

In the following table the imports from the several groups of countries are given, showing what proportion of the imports of each were free and what dutiable, with the per cent. of free:

Statement showing the imports from countries south of the United States and the per cent. of imports free of duty during the year ending June 30, 1890.

Countries.	Imports.			Per cent. of free.
	Free of duty.	Dutiable.	Total.	
Mexico.....	\$15,536,100	\$7,154,815	\$22,690,915	68.47
Central American States and British Honduras.....	8,127,600	111,675	8,239,275	98.65
West Indies.....	10,502,738	67,501,503	78,004,241	13.45
South America.....	82,976,418	7,929,726	90,906,144	91.19
Total of group.....	116,242,856	82,697,719	198,940,575	58.44

The principal dutiable articles imported were sugar and tobacco.

From the West Indies the imports consisted mainly of these articles, and the per cent. of the value of free merchandise was only 13.45.

The principal articles imported from the entire group free of duty, in the order of their value, were: Coffee, India-rubber, crude; hides and skins other than fur-skins, silver-bearing ore, and fruits.

The principal articles of domestic export from the United States to the entire southern group consisted mainly of iron and steel and manufactures of cotton, manufactures of wood, manufactures of wheat flour, mineral oil, and agricultural implements.

CANADIAN RAILWAY TRANSPORTATION.

The Secretary's attention has been frequently directed to the unsatisfactory conditions of Canadian railway traffic with the United States, and many complaints have been made that the rules and regulations of this Department, touching the bonding and sealing of cars, discriminate against our own people. It is manifestly unjust to accord Canadian railroads privileges denied to our own. It certainly was not the intent of Con-

gress to relieve those roads from obligations imposed upon our own transportation companies. Yet the practical working of the law, under the construction insisted upon by the Canadian companies, leads to that result. If their construction be accepted, Canadian railroads, not under bonds for the purpose, may transport dutiable merchandise from seaports in Canada to places within the United States, with only nominal customs supervision, while our own railroads can not carry like merchandise from Atlantic and Pacific ports, in the United States, to points wholly within our own territory, except under heavy bond and strict customs control.

It is also urged with much earnestness and force that the combined effect of the interstate-commerce act, and Treasury regulations, operate greatly to the disadvantage of our own transportation interests in competition with Canadian lines. Those who make these complaints insist that the conduct of the Dominion Government towards our transportation and other interests, both on the land and water, does not suggest any ground for the extension of favors on our part, and they protest against such acts of international courtesy at the expense of the very interests which Canadian policy has persistently sought to destroy. Several hearings have been given to persons interested in this subject, which will receive careful consideration with a view to removing, as far as proper and practicable, any just cause of complaint against the action of this Department.

NAVIGATION.

The entire documented tonnage of the United States is reported by the Bureau of Navigation to be as follows:

Documented vessels.

	1890.	
	No.	Tons.
Registered.....	1,527	945,035.69
Enrolled and licensed.....	21,940	3,477,801.75
Total.....	23,467	4,424,497.44

The registered tonnage of the United States has decreased 74,899 tons in the last year, and the enrolled and licensed tonnage in the same period has increased 191,921 tons.

Our sailing tonnage has increased 10,235 tons, and our steam tonnage has increased 23,537 tons during the last year.

The vessels built during the last fiscal year were as follows :

Class.	1890.	
	No.	Tons.
Sailing vessels.....	505	102,873.03
Steam vessels.....	410	139,043.64
Canal boats.....	40	4,345.75
Barges.....	96	27,858.02
Total.....	1,061	294,122.75

The following table shows the tonnage built, apportioned in respect to the several grand divisions of the country :

Grand divisions.	1887.		1888.		1889.		1890.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Atlantic and Gulf coasts.....	540	73,921.17	604	83,168.43	657	93,912.24	063	136,755.99
Pacific coast.....	73	9,139.61	104	21,256.43	112	17,979.43	93	12,334.72
Northern lakes.....	132	56,488.32	222	101,102.87	225	107,080.39	191	108,523.87
Western rivers.....	79	10,500.93	84	11,859.15	83	12,202.36	104	16,505.98
Total.....	844	150,450.03	1,014	218,086.88	1,077	231,134.33	1,051	294,122.76

The iron vessels built in 1890 amounted to 80,378 tons. During the fiscal year there were built at the lake ports 23 iron vessels, with a tonnage of 38,602 tons, and on the Atlantic coast, 41,776 tons. The documented iron tonnage on the lakes is 29,327 tons, and on the sea-coast, 494,004 tons. The tonnage on the Northern lakes June 30, 1890, was 1,063,064 tons; on the Western rivers, 294,446 tons; on the Pacific coast, 428,392 tons; and on the Atlantic and Gulf coasts, 2,638,595 tons.

The foreign-going tonnage, exclusive of that engaged in the whale fisheries, is 928,062 tons, of which 193,706 tons are steam vessels, and 731,356 tons are sailing vessels.

Of our total documented tonnage, 1,859,088 tons are steam, and 2,565,409 tons are other than steam.

The registered vessels include the documented tonnage above mentioned, in the foreign sea-going trade, and 18,633 tons in the whale fishery. The enrolled or licensed vessels include 3,409,434 tons documented under the federal laws, and engaged in the "coasting trade" along the sea-coasts, the rivers, and the great lakes of the United States, and 68,367 tons licensed for the fisheries.

Besides the coasting vessels, there is a large number of inferior craft, not required by law to be documented, consisting of barges and flat-boats, which represent a tonnage of several hundred thousand, and there is also a very considerable tonnage consisting of canal-boats, har-

bar-boats, lighters, and small craft of various sorts, unenumerated under the laws of the United States, except once in ten years.

The aggregate of all these vessels, documented and undocumented, constitutes an immense fleet, which, while not so great as that of the United Kingdom, is second thereto, and equal to a large portion of the residue of the world's tonnage. It gives employment directly and indirectly to many persons, and keeps in existence a hardy set of men, more or less inured to life upon the water, and who would undoubtedly be of service in case of war between the United States and a foreign naval power. It represents no small portion of the nation's wealth. The building, equipping, and navigating of the vessels, sailing and steam, forms a flourishing industry, which would hardly be in existence, were it not for the protection afforded by the federal laws, reserving the business to citizens of the United States. But for the beneficent effect of these laws, the ships of aliens would speedily monopolize this trade, as they have already the unprotected foreign trade.

Values of the imports and exports of merchandise of the United States carried, respectively, in cars and other land vehicles, in American vessels, and in foreign vessels, during each fiscal year from 1857 to 1890, inclusive, with the percentage carried in American vessels (coin and bullion included from 1857 to 1879, inclusive, as method of transportation can not be stated).

Year ending June 30—	Imports and exports—				Percentage carried in American vessels.
	In cars and other land vehicles.	In American vessels.	In foreign vessels.	Total.	
1857		\$510,331,027	\$213,519,796	\$723,850,823	70.5
1858		447,194,394	199,090,267	646,284,661	73.7
1859		465,741,381	229,813,211	695,554,592	66.9
1860		507,247,767	255,040,793	762,288,560	66.5
1861		584,516,789	323,472,278	907,989,067	65.2
1862		217,695,418	218,015,296	435,710,714	50.0
1863		241,872,471	343,056,031	584,928,502	41.4
1864		184,061,486	453,794,548	637,855,034	27.5
1865		167,492,872	437,010,124	604,502,996	27.7
1866		325,711,851	685,226,691	1,010,938,542	32.2
1867		237,834,504	581,330,403	819,164,907	31.2
1868		297,981,573	550,546,074	848,527,647	35.1
1869		289,956,772	566,422,012	856,378,784	33.1
1870		352,989,401	638,927,499	991,916,900	35.6
1871		358,034,172	756,322,576	1,114,356,748	31.2
1872	\$22,088,510	345,331,101	829,546,392	1,212,955,253	28.5
1873	27,909,978	346,036,592	896,725,651	1,349,682,221	25.8
1874	22,022,540	330,451,554	929,285,106	1,312,699,200	26.7
1875	29,998,236	314,257,792	884,788,517	1,219,434,544	25.5
1876	18,473,154	311,076,171	813,354,997	1,142,904,322	27.2
1877	17,464,810	316,666,281	859,920,536	1,194,045,627	26.5
1878	20,475,264	313,099,590	876,991,129	1,210,575,969	25.9
1879	19,428,085	272,015,622	911,299,292	1,202,708,699	22.6
1880	20,981,393	238,346,577	1,224,265,434	1,593,593,404	17.18
1881	25,452,521	229,589,470	1,269,092,993	1,545,041,974	16.22
1882	34,978,817	227,259,745	1,212,978,769	1,475,181,801	15.40
1883	48,062,892	240,430,500	1,238,556,924	1,547,050,316	15.54
1884	46,714,068	233,609,035	1,127,708,199	1,408,211,302	15.60
1885	40,322,775	194,895,743	1,079,518,566	1,319,717,084	14.76
1886	43,700,350	197,349,563	1,073,911,113	1,314,969,026	15.01
1887	48,951,725	194,376,746	1,103,194,598	1,406,522,679	13.80
1888	64,336,827	190,857,473	1,174,927,321	1,439,911,621	13.44
1889	66,664,879	203,895,108	1,217,003,541	1,487,563,527	13.70
1890	73,501,263	202,451,880	1,371,116,744	1,647,139,887	12.29

It is impossible to present a stronger argument than is contained in the above figures for vigorous and efficient measures in behalf of our rapidly vanishing foreign merchant marine. They show that the relative decline in our foreign carrying trade has been constant and alarming. This decline has averaged $1\frac{1}{2}$ per cent. per annum since 1857 until in 1890 the percentage of imports and exports carried in American vessels was less than in any year since the formation of the government. These figures appeal alike to our national pride and our national interests. The folly and the danger of depending upon our competitors for the means of access to foreign markets need not be stated. The humiliation of witnessing the disappearance of our flag from the high seas, without one effort to restore it to its former proud position can not be expressed. Surely no subject is of greater importance than the enlargement of our foreign markets, and nothing will contribute more to that end than the command of ample facilities for reaching them. Aid to our merchant marine is not aid to a class, but to the farmer, the manufacturer, and the merchant, as well as to the ship-builder and ship-owner. No interest is more thoroughly interwoven with all others, or more worthy of the fostering care and protection of the nation. None has been so vigorously and effectively assailed by foreign Governments, nor so persistently ignored and neglected by our own. The reasons for our present humiliating position are well known. The remedy is plain and easily within our power. In the Secretary's annual report for 1889 are stated somewhat in detail the causes of present conditions, and the practical remedy for them. These recommendations are now renewed and respectfully urged upon the prompt and favorable consideration of Congress.

LIGHT-HOUSE SERVICE.

The number of light-stations was increased from 783 to 833. Three new light-ships are nearly ready for service, and designs are being prepared for four others, several of which are to show electric, revolving, or other distinctive lights.

The number of buoys, spindles, and day beacons was decreased from 4,693 to 4,651, owing to the paucity of the appropriation for the expenses of buoyage. The other appropriations for the support of the Light-House Establishment have proved inadequate for its needs. Appropriations for new works have been increased out of proportion to the appropriations for the maintenance of existing structures.

A contract has been made for the establishment of a light-house on Diamond Shoal, off Cape Hatteras, for which the contractor is to have

no pay until the light is erected, when he is to receive \$485,000 for this most difficult and dangerous feat of sub-marine engineering.

The wording of several of the general appropriations for the support of the Light-House Establishment, which were formulated in its early days, appears to need revision, as the advances made in the arts and sciences have somewhat affected the service. The need of these changes is fully set out in the Board's annual report.

During the last fiscal year there were some 5,000 miles on 25 rivers lighted by about 1,600 post-lights, at an average cost per year of \$160 each. No expenditure made by the Government has given more satisfaction than that spent in the lighting of rivers. It has revolutionized steamboat navigation, making it nearly as safe to run by night as by day. River navigation is increasing in consequence, and the Board is unable to keep up with the reasonable demands for more lights, because of insufficient appropriations for their establishment and maintenance. The estimate of the Light-House Board for an increase of the appropriation for lighting rivers should receive attention.

The Light-House Board, which is charged by statute with the responsibility of having bridges over navigable rivers properly lighted, states in its annual report that it can not enforce the law, as no penalty is prescribed for its infraction.

The exhibition of private lights should be prohibited, and the Board should be empowered to temporarily show inexpensive lights to meet emergencies, the continuance of which should be subject to the action of Congress. The reasons for this are cogently set out in the report of the Light-House Board.

LIFE-SAVING SERVICE.

The operations of this service have been attended during the year with the usual beneficent results.

The number of stations in commission at the close of the year was 233. The number of disasters to documented vessels reported by the district officers is 384. The number of persons on board these vessels was 3,197, of whom 3,159 were saved, and 38 lost. The value of the property involved is estimated at \$7,555,908, of which \$5,451,843 was saved, and \$2,104,065 lost. The number of vessels totally lost was 76.

There were besides 145 disasters to smaller craft (sail-boats, row-boats, etc.), on which were 299 persons, 289 of whom were saved, and 10 lost. The value of property involved in these minor disasters was \$61,527, of which \$59,102 was saved, and \$2,425 lost.

In addition to the persons saved from vessels as above stated, 27 others were rescued, who had fallen into the water from piers, wharves,

etc., and would probably have perished but for the timely aid of the life-saving crews.

Assistance was rendered in saving vessels and their cargoes in 464 instances by the life-saving crews, in working them off when stranded, repairing them when damaged, piloting them out of dangerous places, etc. There were 227 instances besides in which vessels were warned off by the signals of the patrolmen when in danger of stranding.

The cost of the maintenance of the service during the year was \$913,786.47.

Since the date of the last report stations have been established and put in operation at Wallis Sands, New Hampshire; Point Allerton and Cullyhunk, Massachusetts; Oak Island, North Carolina; South Chicago, Illinois; Point Adams, Oregon; and Point Reyes and Fort Point, California. There are besides stations in process of construction at Knobb's Beach and Great Neck (Nantucket Island), Massachusetts; Marquette and Bois Blanc Island, Michigan; and Umpquah River, Coos Bay, and Coquille River, Oregon.

The station at Humboldt Bay, California, has been rebuilt and enlarged, and new station-houses at Rye Beach, New Hampshire, and Plum Island, Massachusetts, are approaching completion. Extensive repairs and improvements have also been made to several stations on various portions of the coast.

The telephone line on Long Island, in process of construction at the date of the last report, has been completed, and a line has been extended from station to station, along the coast of Cape Cod.

The insufficiency of the compensation of surfmen, referred to in the last report, continues to embarrass the service in securing and retaining the best ability, especially on the Great Lakes, where, during the past year, over 30 per cent. of the force have left the stations to accept more lucrative employment. The service is thus compelled at the approach of winter to rely in a great degree upon raw recruits for the dangerous work which attends the closing of navigation in this region, when training and experience in the methods of the service are most needed. Similar trouble, though to a somewhat less extent, is experienced on portions of the ocean coast. The hope is again expressed that appropriate action to remedy this difficulty, which is liable to occasion serious results, may not be delayed.

STEAMBOAT-INSPECTION SERVICE.

There were upward of 7,000 inspections of steam-vessels during the last fiscal year, and more than 33,000 officers of such vessels were

licensed. There was a moderate increase of inspections and licenses, and a decrease of more than one-fifth in the number of lives lost. Of an estimated number of 500,000,000 passengers carried in the inspected vessels during the year 65 lost their lives. There were 256 inspections of foreign steam-vessels during the fiscal year.

The record of the service for the past twenty years exhibits a steady progression in the number of vessels and passengers, and a constant decline in the ratio of disasters and in the average cost of inspections per vessel.

REVENUE-MARINE SERVICE.

In the Revenue-Marine Service thirty-six vessels have been in commission during the year. One new vessel has been constructed and assigned to duty at Charleston, S. C., and two vessels are under construction, one for duty at New Berne, N. C., and the other at Galveston, Tex. The record of the vessels in commission during the year shows nautical miles cruised, 288,112; vessels boarded and examined, 23,161, of which number 915 were found violating the law, by which they incurred fines and penalties to the amount of \$396,616. Eighty distressed vessels were assisted, of the value, including their cargoes, of upward of \$2,500,000. Forty-three persons were rescued from drowning.

The revenue cutters during the year also rendered valuable aid to the Life-Saving Service, cruising, while on that duty, a distance of 9,883 miles.

The revenue steamer *Manhattan* was assigned to the enforcement of the anchorage regulations prescribed for the bay and harbor of New York. During the year 1,750 vessels were found improperly anchored; of this number 1,365 were assisted to a proper anchorage, and the remainder moved upon notice to do so.

During the summer the revenue steamer *Bear*, in her annual cruise to the Arctic, rendered assistance to the whaling fleet in that region, gave medical attendance and furnished medicines to more than 140 whites and natives of Northern Alaska, and conveyed to Point Barrow fuel, provisions, outfits, etc., for the refuge station at that place. The officers of the *Bear* inspected the accounts and property of the station, and the crew assisted in the erection of a small new building to be used as a store-house. The *Bear* also visited the coasts of Siberia and distributed to the Esquimaux natives the presents purchased by act of Congress of April 2, 1888, for acts of humanity to the crew of the wrecked whaling bark *Napoleon*.

The commanding officer of the *Bear* was appointed an agent for taking the census in Northwestern Alaska, and for that purpose visiting native villages that could not otherwise have been readily reached.

Transportation was given to representatives of the geographic society, and also to the Commissioner of Education for Alaska, as assistance rendered him by the officers and crew in the erection of Government school-houses at Cape Prince of Wales and at Point Hope.

The revenue steamer *Rush* cruised from July 9 to September 11 in the vicinity of the seal islands, for the protection of the interests of the Government on and around those islands and the sea-otter hunting grounds. It also conveyed the United States commissioner with several prisoners from Western Alaska to Sitka for trial.

The *Manhattan* is not able to efficiently perform the service required of her at New York, and should be replaced by a larger and more powerful vessel.

The increased work required of the revenue cutters in Alaska waters demands the immediate construction of a new vessel for duty on the Pacific coast.

The expenditures on account of the service for the year have been \$937,033.67, of which \$17,272.81 was spent in enforcing the law regulating the anchorage of vessels in the bay and harbor of New York.

The personnel of the service remains the same as last year—220 commissioned officers, 27 pilots, and 815 seamen.

MARINE-HOSPITAL SERVICE.

This Service is annually growing in importance and in the general scope of its operations. The Surgeon-General reports that during the last year there were 50,671 sailors treated in the various marine hospitals and dispensaries; that there were 1,245 pilots examined for color blindness, of whom 41 were rejected; that there were 1,133 surfmen examined physically for the Life-Saving Service, of whom 72 were rejected for disease or disability; 536 seamen of the Revenue-Cutter Service were examined, of whom 37 were rejected; 22 light-house keepers were examined, of whom 2 were rejected.

Seven quarantine stations have been maintained during the year as two hygienic laboratories. There were 2,059 vessels inspected at the national quarantines, of which 80 have been detained for fumigation. There were 970 immigrants treated in the barge office, of whom 483 were treated in hospital.

The total receipts of the Service from the tonnage tax, including payments, were \$571,697.53. There have been expended from this source \$566,818.31.

For the prevention of epidemic diseases there have been expended \$38,103.28, and for the quarantine service \$41,806.54.

The report of the Supervising Surgeon-General, besides an exhibit of the general operations of the Service, contains interesting information concerning foreign hospitals visited by him while under detail as a delegate to the tenth International Medical Congress. He also submits a special report on Immigration, as the result of his observations abroad, and the experience of the Marine-Hospital Service in the examination of immigrants at the port of New York, and recommendations are submitted for the more effective exclusion of undesirable immigrants.

No general epidemic from preventable diseases has occurred during the year, although several cases of yellow fever have been detained at the several quarantines. The new quarantine station at San Francisco is now under construction.

A circular for the prevention of the introduction of lepers into the United States was prepared by the Supervising Surgeon-General, and approved by me December 23, 1889.

COAST AND GEODETIC SURVEY.

The report of the Superintendent of the Coast and Geodetic Survey supplies many interesting and important details of the field, magnetic, and hydrographic work of the highly accomplished corps under his direction. An officer of the corps formed a part of the scientific company attached to the Eclipse Expedition to the west coast of Africa, and brought home valuable results within his own sphere of investigation.

Publications of the Survey continue to grow in number and circulation, a fact which emphasizes the recommendations heretofore made for increasing the office accommodations of the service.

It would be to the public advantage if statutory provision were made for ascertaining and fixing a proper line of division between the hydrographic work of the Survey and that performed under the direction of the Navy Department. Better results might naturally be expected if each service had the means of knowing the limits of its own field.

Standard weights and measures have been supplied to the recently admitted States of the Union. Much service has been rendered in verifying weights and measures used as standards in various parts of the country. I recommend the conferring of statutory authority upon the Executive to prescribe and regulate the manner of safely keeping the metric standards furnished to the Government of the United States

from the International Bureau of Weights and Measures at Paris under the provisions of the international treaty of 1875. These prototypes are of extraordinary accuracy and finish, and are probably destined at no distant day to become of very great practical importance to our people.

The metric system of weights and measures was optionally established by law in 1866. Since that time it has become obligatory among nearly all civilized peoples, and its use in this country was strongly urged by the International American Conference lately in session at Washington. Upon consideration of the matter, it is recommended that the metric system be made obligatory in transactions at our custom-houses from and after the first day of the calendar year 1895. A statutory provision to that effect would doubtless lead to the general adoption of the system by the public, unaccompanied by serious inconvenience.

RECOMMENDATIONS OF UNITED STATES DELEGATES TO THE INTERNATIONAL MARINE CONFERENCE.

Pursuant to resolution of Congress, the Secretary has examined the report and recommendations made by the delegates to the United States International Marine Conference, dated February 20, 1890, so far as they apply to subjects under the jurisdiction of this Department, and, as required by said resolution, has prepared and will submit bills to Congress for the carrying of said recommendations into effect.

IMMIGRATION.

The contract existing since 1882 between this Department and the Board of State Emigration Commissioners at the port of New York was terminated last April, because of a want of harmony between the officers of this Department and the Commissioners, and because it was believed that the Department could administer the service with greater economy and efficiency through agencies under its own control.

These expectations have been fully realized. A temporary immigrant depot was established at the barge office, which, though not entirely satisfactory, has met the immediate requirements of the service. Vigilance and economy have been exercised, and the expense for care and maintenance of immigrants under the present management has been only one-third of the cost for the corresponding period of the preceding year. From April 19 to October 1, 1890, \$13,497.50 were expended, while calculated by a yearly average the same service would have cost under the State board \$38,256.12.

The immigrant fund, made up from the head tax, was reduced during the period from July 1, 1883, to April 19, 1890, when the Department's own officers took charge, from \$100,086.03 to \$77,961.59, a decrease of over \$22,000, while during the much shorter time intervening to the 1st of November the fund has been increased to \$119,863.06, an increment of nearly \$43,000. In the course of a few months the permanent depot at Ellis Island, in the harbor of New York, will be ready for use. At the ports of Portland, Boston, Philadelphia, Baltimore, Key West, New Orleans, Galveston, and San Francisco, the contracts with the State authorities for the conduct of the immigrant business remain in force.

The noticeable feature of our immigration in recent years has been a change in the character of many of the immigrants, who do not readily assimilate with our people, and are not in sympathy with our institutions.

So long as undesirable immigration was a matter of rare occurrence and desirable immigration the rule, the rational policy was pursued of permitting all to come to our shores who desired to do so. The conditions are now materially changed, and the tendency of Congress, as shown by the Alien Contract, Panper and Chinese Exclusion Acts, has been to limit and restrict immigration.

It is a matter of public knowledge that transportation from any part of Europe to our Atlantic ports is so cheap and easy as practically to exclude none, and the consequence is that our asylums for the poor, the sick, and the insane, and our prisons are crowded with strangers, whose charge upon the public may be said to have begun with their landing.

Further legislation is needed to exclude persons unfit for citizenship, and it is therefore recommended that all immigrants be required, as a condition precedent to their landing, to produce evidence attested by our consular officers of their moral, mental, and physical qualifications to become good citizens.

Our country owes too much in greatness and prosperity to its naturalized citizens to wish to impede the natural movement of such valuable members of society to our shores, and it is an additional argument in behalf of the proposed plan of certification, that it would lend encouragement to the continuance of such additions to our population.

Alien Contract-Labor Law.

With the administration, at New York, of the immigration laws entirely within the control of the Department, a more satisfactory and effective enforcement has been possible of the laws against the intro-

duction into the United States of laborers who come under contract. The inspectors appointed by the Department work under the direct of, and in sympathy with, the superintendent of immigration, and a unity of interest to this end the object of the law is more surely attained. From April 19, 1890, to October 1, 1890, one hundred and twenty-three imported aliens were detected and returned, while during the longer period, from March 1, 1889, to April 19, 1890, but forty persons were sent back. From all the ports less than fifty alien contract laborers were returned during the four years preceding March 1889; while since that date two hundred have been so deported.

The defense of our wage workers against unfair competition is essential a part of the industrial protective system of the country, and nothing should be left undone in legislation or administration to make it effective. The law should, however, be amended, as suggested in last report, so as to relieve clergymen, teachers, and scientists from prohibitive features.

Chinese Exclusion.

The Department has not relaxed its efforts to secure a strict enforcement of the Chinese Exclusion Act. Organized attempts have been made by Chinese laborers to force their way into the United States by way of Mexico, British Columbia, and Canada. These movements have been efficiently met, and the unlawful immigration not only checked, but in most instances wholly arrested.

A large number of prohibited Chinese that have found illegal entrance into the United States have been returned to China, as "the country from whence they came," rather than to the contiguous foreign territory through which they passed on their way hither, as was formerly the practice, and which resulted in their ultimately finding a way to re-enter the country in some other quarter.

This policy, coupled with the refusal of the Department to allow transshipment, in our ports, of Chinese for British Columbia and Mexico, has had a salutary effect, and will be continued, if a sufficient appropriation is made for that purpose.

ALASKA.

There is an urgent necessity for legislation creating new ports of delivery in the Territory of Alaska.

The industrial development of the Territory has continued with the vigor and enterprise indicated in my last Annual Report.

It is impracticable, even if it were advisable, to wholly arrest the wholesome and natural progress of that section of the country until

years of legislation can be brought up, and the consequence is that a revenue and navigation system is in operation which is less the creation of statute than of the necessities of the situation, and is open to most, if not all, of the objections which belong to the grafting of improper methods upon a settled and comprehensive system. These conditions, involving violations to a greater or less extent, will continue in the absence of needed legislation.

Lease of the Seal Islands.

The lease of the Seal Islands, in Behring Sea, to the Alaska Commercial Company, for a term of twenty years, having expired during the year, a new lease was made, pursuant to law, with the North American Commercial Company for a like term of twenty years, after a public competition wherein that company proved to be the highest and the best bidder. The pecuniary conditions of the lease are the payment of an annual rental to the United States of \$60,000, a revenue tax of \$2, and royalty of \$7.62½ for each fur-seal skin taken and shipped from the islands of St. Paul and St. George, and 50 cents for each gallon of oil taken from seals killed and sold.

The covenants for the maintenance, care, and improvement of the native inhabitants of the leased islands are also much more extensive and liberal than in the preceding lease. The contract, as a whole, is well adapted to promoting the public and native interests that the law prescribes as primary objects of solicitude.

The Secretary may deem it advisable to communicate further on this subject during the present session of Congress.

PUBLIC BUILDINGS.

During the past year there were under the control of this Department, and receiving the attention of the office of the Supervising Architect—

In course of construction, including extensions and repairs specially appropriated for, 69 public buildings. Of which number, there were completed during the year 21 public buildings.

There were previously completed and subject to repairs, etc., 229 public buildings.

Not yet commenced, 26 public buildings.

Congress during its present session has authorized the acquisition of sites for and the erection of 27 public buildings.

At this date there are completed and occupied 250 public buildings.

There are in course of construction, extensions, for which sites have been or are being selected, or which have not yet been commenced, 100 public buildings.

The following statement shows the aggregate amount of money expended on public buildings during the past year:

For sites and in the construction of new public buildings	\$3,691,341 34
For repairs and preservation of public buildings.....	224,304 12
For heating apparatus for new public buildings.....	12,410 41
For heating apparatus for (completed) public buildings.....	91,972 31
For vaults, safes, and locks for public buildings.....	48,929 72
For photographic duplication of plans for public buildings	4,014 54
For vaults for storage of silver, New Orleans, La., and San Francisco, Cal.	25,676 54
Total expenditure.....	4,104,739 07

The following recommendations of the Supervising Architect of this Department are concurred in:

First. The desirability of Congress, at this session, making the balances of the appropriations under the limits of cost which have been prescribed by legislation, and which amounts have been asked in each case in the "Estimates of Appropriations, 1891-1892," the same being necessary to enable an uninterrupted progress of the buildings, and secure expedition and economy by avoiding delays, and the consequent additional expenses.

Second. The suggestion that an economical regard for the public interests involved in the proper preservation of structures erected for the needs of the Government service makes it advisable that Congress should do one of two things: either to make specific appropriations requested for special repairs to particular public buildings, or to materially increase the amount of the general appropriation for "Repairs and preservation of public buildings."

Third. The advisability of Congress making the full amount of the appropriation in the act authorizing the acquisition of a site and the erection of a public building, when the limit of cost is an amount not exceeding \$300,000, in order that immediate action may be taken in selecting the site, and the best business methods adopted in making contracts under such guarantees as will secure the continued prosecution of the work of erecting the building until its completion.

Fourth. The advance in lighting buildings by electricity has so thoroughly established the superiority and convenience of electric light that a modern structure is incomplete without the system, and it therefore becomes a necessary equipment in the completion of a public building; and it is deemed advisable that an appropriation be made specific for

the purpose of placing electric wires in buildings. Serious delays have resulted in the prosecution of work on new buildings in consequence of the inability to proceed at the proper time to provide electric wiring. The appropriation for "Fuel, lights, and water" is found insufficient to meet the demands upon it, and can not always provide for this expenditure. As no provision has heretofore been made by estimate in the general appropriations, it is therefore recommended that a separate and distinct appropriation of \$125,000 be made for electric wiring to be used in connection with the appropriations heretofore made for the construction of the new public buildings.

Fifth. That a system of competitive designs for public buildings be tried.

Sixth. That the appropriation for "Plans for public buildings" be increased to \$5,000 for the fiscal year ending June 30, 1892.

Seventh. That the appropriation for "Repairs and preservation of public buildings" be increased to \$300,000 for the fiscal year ending June 30, 1892.

Eighth. That the appropriation for "Vaults, safes, and locks for public buildings" be increased to \$75,000 for the fiscal year ending June 30, 1892.

Ninth. That a specific appropriation of \$10,000 be made for "Heating and ventilating apparatus, marine hospitals and quarantine stations," for the fiscal year ending June 30, 1892.

Tenth. That a specific appropriation of \$20,000 for "Repairs and preservation of marine hospitals and quarantine stations" be made for the fiscal year ending June 30, 1892.

RECORD OF REAL PROPERTY BELONGING TO THE UNITED STATES.

Your attention is invited to the need of some legislation for securing a record of titles to real estate now owned or hereafter to be acquired by the United States, and for providing suitable means for examining such titles, perfecting those which are defective, and for the recovery of property wrongfully withheld from the United States.

THE WORLD'S COLUMBIAN EXPOSITION.

Under the provision of the act of Congress, approved April 25, 1890, entitled "An act to provide for celebrating the four-hundredth anniversary of the discovery of America by Christopher Columbus by holding an international exhibition of arts, industries, manufactures, and the products of the soil, mine, and sea, in the city of Chicago, in the State of Illinois," the Secretary of the Treasury is charged with certain duties.

Section 12 appropriates \$20,000, to be expended under the direction of the Secretary of the Treasury, during a period ending June 30, 1891, "for purposes connected with the admission of foreign goods to said Exhibition." In pursuance thereof, the World's Columbian Commission have been authorized to employ such agents or agencies as they may deem necessary, subject to the Secretary's approval as to expenditures.

Plans for the building authorized by Congress are now in course of preparation. It is intended to be of such dimensions as to provide about 200,000 square feet of floor space, at a cost not to exceed the sum named in the act.

In accordance with the provisions of section 18 of said act, there have been approved, up to November 14, vouchers for contingent expenses of the Commission amounting to \$6,539.66, and for the Departmental Board authorized by section 16 amounting to \$294.85.

The total expenditures for all purposes, to November 15, 1890, are as follows:

Traveling expenses.....	\$11,366 91
Subsistence.....	14,121 25
Contingent expenses.....	6,539 66
Expenses Departmental Board.....	294 85
Salaries.....	8,128 73
Total.....	40,511 40

A large number of the Commissioners who have attended the meetings of the Commission have failed to submit any accounts. It is estimated that such accounts will aggregate \$5,000. The total expenditures and liabilities to November 15 will be about \$47,000.

Section 6 of the act authorizes and requires the Commission to appoint a board of lady managers, of such number, and to perform such duties, as may be prescribed by the Commission. In compliance with said section, the Commission appointed a board of lady managers consisting of two from each State and Territory and the District of Columbia; one to be appointed by each of the commissioners-at-large, also nine from the city of Chicago, and a like number of alternates.

The principals of the board number 115 and the alternates the same. No special provision is made by the law for the payment of the expenses of traveling or subsistence for the members of said board, but as their appointment was authorized by law, the Secretary has, upon the recommendation of the Commission, authorized the president of the Commission to notify the members of the board that they will be allowed the usual expenses of transportation, and \$6 per day in lieu of subsistence, while necessarily absent from home engaged in duties which may be pre-

scribed by the Commission. Some definite provision should be made by law for the expenses of said board which will make it unnecessary to treat such disbursements as a "contingent expense."

The salaries of the officers of the Commission were fixed by a unanimous vote of the Commission, and for that reason they were approved.

OFFICIAL FILES OF THE GOVERNMENT.

For years past the crowded condition of the files in the Treasury Department has been a matter of earnest consideration, and various methods have been, from time to time, suggested for their relief.

The First Auditor, early last spring, called my attention to the want of uniformity that existed in the sizes of the blank forms which appear in the accounts rendered to his office, and suggested that valuable filing space might be saved, and the papers be better preserved, if they were reduced to a uniform standard. A committee of experienced officers of the Department was accordingly appointed to investigate the matter, with instructions to report to me the result of their inquiries. The investigation of the committee, which was intelligent and thorough, covered a period of more than four months, and the facts ascertained were both interesting and valuable.

The standards of sizes recommended by the committee were approved by me, and a circular was recently issued instructing the officers and employes of the Department to conform to them.

It is believed that with the promised co-operation of the other Executive Departments, and by careful watching on the part of the clerks in the accounting offices, the adopted standards may be maintained so far as the blanks entering into the accounts filed in this Department are concerned; but it would seem advisable to apply the system, as far as practicable, to all branches of the public service. Legislation by Congress requiring all Departments of the Government to adopt the Treasury or some other uniform practical filing standard is recommended.

SALE OF USELESS PAPERS.

In accordance with the provisions of the act of Congress approved February 16, 1889, about 400 tons of useless official papers have been sold, from the files of the Treasury Department, at prices ranging from \$8.20 to \$37.20 per ton. The total amount derived from such sale, amounting to \$8,070.76, has been covered into the Treasury. The files space gained by the removal of said papers is of great value to the Department, but files are accumulating so rapidly that it seems the

only feasible plan for permanent relief, in connection with files space, will be the erection of a building devoted exclusively to the storage of papers which it is deemed necessary to preserve, but which are seldom referred to.

The space to be gained by the removal of such files can be profitably utilized for the accommodation of clerks in this Department, who have not now the proper rooms for the transaction of the public business.

DISTRICT OF COLUMBIA.

The net expenditures on account of the District of Columbia for the fiscal year 1890 were \$5,677,419.52. The revenues deposited in the Treasury on this account, for the same period, were \$2,809,130.93.

There have been issued during the fiscal year 1890 \$28,450 of the 3.65 per cent. bonds, in satisfaction of judgments of Court of Claims against the District. There have been retired by the operations of the sinking-fund during the same period \$389,450 of the bonded indebtedness of the District, making a net reduction of \$361,000, and reducing the annual interest charge \$23,200.

When the duties of the late commissioners of the sinking-fund were assumed by the Treasurer of the United States, on July 1, 1878, the bonded debt amounted to \$22,106,650, which has since been increased \$945,950 by the issue of 3.65 per cent. bonds in exchange for certificates of the board of audit and in payment for judgments of the Court of Claims. There have also been issued \$1,092,300 twenty-year 5 per cent. funding bonds, to replace maturing bonded indebtedness. The bonds retired during the same period amounted to \$4,363,830. The bonded debt July 1, 1890, was \$19,781,050, showing a net reduction of \$2,325,600, and a reduction in the annual interest charge of \$160,357.72.

Of the bonded indebtedness of the District \$3,010,850 will be payable in 1891, and \$920,300 in 1892. As all of these maturing bonds bear 6 or 7 per cent. interest, provision should be made to refund them at a lower rate of interest, and attention is invited to the plan submitted in the Treasurer's annual report on the sinking-fund.

The amount realized from the sale of bonds in which the retentions from contractors with the District of Columbia were invested exceeds the sum necessary to pay the amounts originally withheld. The net surplus at the close of the fiscal year 1890 was \$30,676.18, and has been deposited in the Treasury as a miscellaneous receipt to the credit of the United States and District of Columbia in equal parts, as required by the act of February 23, 1855.

Detailed information in regard to the affairs of the District of Columbia will be found in the report to be submitted by the District Commissioners and by the Treasurer of the United States, *ex-officio* commissioner of the sinking-fund of the District.

CIVIL SERVICE.

The past year's experience of the excellent working of the civil service law, supplemented as it is in this Department by a thorough system of departmental examinations for promotions, adopted twenty years ago, leads me to emphasize what was said on this subject in my last annual report.

Inasmuch as the current year has included an active political canvass in all the States, it is deemed not inappropriate to say that so far as this Department is concerned, there has been entire and uniform compliance with the requirements of law respecting the collection of money for political purposes from Government employes. All such employes, regardless of political preferences, have been, and have apparently felt, quite as much at liberty as other citizens to contribute or refrain from contributing for the benefit of the political party of their choice. Attention is invited to the accompanying report of the Board of Examiners of this Department.

The several reports of the heads of offices and bureaus are herewith transmitted.

WILLIAM WINDOM,
Secretary of the Treasury.

The Honorable

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

P A P E R S
ACCOMPANYING
THE REPORT OF SECRETARY OF THE TREASURY.

REPORT OF THE TREASURER.

TREASURY OF THE UNITED STATES,
Washington, November 1, 1890.

SIR: I have the honor to submit the annual report on the operations and condition of the Treasury.

REVENUES AND EXPENDITURES.

The net ordinary receipts for the fiscal year ending June 30, 1890, were \$403,080,982.63, a sum but twice exceeded in the history of the Government. As compared with the preceding year there was an increase of \$16,030,923.79, of which \$11,725,191.89 was derived from the internal revenue. The ordinary expenditures, including interest on the public debt, but not premium or principal paid, were \$297,736,486.60, an increase of \$15,739,871 over those of the year before. The growth of the revenues and expenditures was, therefore, almost the same, with the advantage on the side of the revenues. But for the increase of the disbursements for pensions there would have been a falling off in the total expenditures. The surplus of revenues over ordinary expenditures was \$105,344,496.03, of which \$20,304,224.06 was paid out in premiums on bonds purchased.

The receipts on account of the public debt, amongst which are classed gold coin, standard silver dollars, and United States notes received or set apart in the assets of the Treasury for certificates of deposit issued, together with the amount of United States notes issued and of principal and interest of refunding certificates converted into 4 per cent. bonds, amounted to \$245,293,650. The expenditures on the same account, comprising the amounts applied to the redemption or purchase of the principal of bonds and to the redemption of certificates of deposit, notes, and fractional currency, were \$312,206,367.50.

According to the warrants, the postal revenues amounted to \$61,106,041.29, of which \$25,325,842.57 was paid into the Treasury, and \$35,780,198.72 was handled by postmasters. Including a deficiency appropriation of \$7,200,000, of which, however, \$324,963.09 was deposited in the Treasury from the revenues of a former year, the total receipts were \$68,306,041.29, and the total expenditures \$67,011,263.64. There was an increase of \$5,411,809.76 in the revenues, and one of \$5,829,515.63 in the expenditures, as compared with the fiscal year 1889.

The following statement shows the ordinary receipts and expenditures in comparison with those of the preceding year:

	1889.	1890.	Increase.	Decrease.
Revenue from—				
Customs.....	\$223,478,745.00	\$229,608,564.87	\$6,129,819.87	
Internal revenue.....	180,881,344.92	149,608,705.81	11,725,181.80	
Sale of public lands.....	8,038,657.79	6,858,272.51		\$1,080,385.28
Miscellaneous sources.....	24,297,151.44	24,847,419.74	150,268.30	
Total.....	387,056,958.84	409,089,962.63	27,711,303.07	1,080,385.28
Net increase.....			16,930,923.79	
Expenditures on account of—				
Civil and miscellaneous:				
Customs, light houses, public buildings, etc.....	29,154,142.08	19,784,371.91		413,770.17
Internal revenue.....	3,941,400.00	3,028,085.31		13,307.90
Interior civil claims, patents, etc.....	7,050,700.25	8,442,413.14	1,092,022.89	
Treasury proper (legislative, executive, and other civil).....	42,847,717.40	43,430,561.08	582,843.68	
Diplomatic foreign relations.....	1,891,628.72	1,648,376.59		303,349.13
Judiciary.....	4,463,372.51	4,370,565.40		263,757.02
War Department.....	44,435,270.85	44,522,888.08	117,597.23	
Navy Department.....	21,275,809.81	22,095,708.24	827,898.43	
Interior Department (Indians and pensions).....	94,210,930.80	113,544,061.74	19,127,914.25	
Interest on public debt.....	41,091,184.29	36,090,284.05		4,002,500.24
Premium on public debt.....	17,202,662.02	20,304,224.00	3,011,801.41	
Total.....	299,228,978.15	314,049,710.89	24,580,204.06	5,828,474.55
Net increase.....			18,704,702.41	
Surplus.....	87,761,080.59	85,040,271.97		2,720,808.62

STATE OF THE TREASURY.

At the close of business on June 30, 1889, the Treasurer stood charged on the books of the Department with \$673,399,118.18, being the balance of the moneys of the Treasury shown by the accounts to be in his custody. To this were added the receipts of the ensuing year from the revenues and on account of the public debt, in all \$648,374,632.63, together with the sum of \$731.11 recovered from a former depository, making an aggregate of \$1,321,774,481.92, for which the Treasurer was accountable during the fiscal year. Of this he disbursed upon the warrant of the Department the sum of \$630,247,078.16 as the expenditures of the year upon all accounts, leaving \$691,527,403.76 charged to him as the balance on hand June 30, 1890.

The balance at the beginning of the year, however, included \$28,101,644.91 on deposit with the States, which was not in any sense in the Treasurer's custody, and \$1,415,433.91 of funds that had been lost at various times, and for which he was not responsible, so that the true amount of cash for which he was accountable, according to the books of the Department, on June 30, 1889, was \$643,882,039.36. But on that day he held also public moneys amounting to \$728,342.40, of which the Department had not yet taken account, and the further sum of \$116,033,489.50 on deposit with him for various purposes, which was not treated by the Department as part of the cash of the Treasury. The actual available assets of his office at that date were, therefore, \$760,843,871.26, as stated in his last report.

On June 30, 1890, the balance standing charged to the Treasurer was subject to the same deduction for deposits with the States and for unavailable funds, while \$323,589.78 of receipts not yet covered by warrant and \$95,581,164.22 on deposit in the Treasurer's agency account

were to be added to make the total sum in his custody, which was \$157,915,078.94. The actual cash and other assets of the Treasury on the two dates were as follows:

	June 30, 1889.	June 30, 1890.
Gold.....	\$603,387,710.70	\$620,924,145.02
Silver and minor coin.....	215,100,770.58	316,821,008.09
Notes.....	51,442,808.05	25,242,128.30
Certificates of deposit.....	42,015,504.60	21,715,032.00
Deposits in banks.....	47,250,714.39	50,654,565.22
Public debt and interest paid.....	741,645.45	27,534.29
Total.....	700,643,871.26	757,915,078.94

In the appendix will be found tabular statements showing in detail the character and distribution of the various items of cash and credit of which the foregoing is a summary. From these the most minute particulars deemed to be of any public interest, relating to the means at the disposal of the Treasurer for meeting his accountability to the Department, may be gathered.

In considering the state of the Treasury with reference to the financial operations of the Government, it seems convenient to separate from the other assets the gold and silver coin and United States notes on deposit for certificates in circulation. These moneys are of importance to the Treasury only as they affect the currency, and they will be noticed in connection with that subject. In this way and by omitting the items of debt and interest paid, the following result is reached, exhibiting the assets of the Treasury belonging to the Government:

	June 30, 1889.	June 30, 1890.
Gold.....	\$156,237,400.70	\$190,102,286.02
Silver and minor coin.....	56,928,214.55	49,764,828.09
Notes.....	34,439,508.05	16,458,138.30
Deposits in banks.....	47,250,714.39	50,650,465.22
Total.....	326,028,927.81	326,984,817.73

These figures show the satisfactory change which, in spite of the difficulties arising from the state of the revenues and of the bonded debt, the Treasury underwent in the course of the year. The loss of \$40,000,000 in the net holdings was, under the circumstances, an advantage to both the Treasury and the public, while the notable increase in the amount of gold, not less than the substantial decrease in the silver, notes, and bank deposits, was at once a gain in strength and a proof of the confidence of the country.

The liabilities, on the same dates, according to the form of statement then in use, were as follows:

	June 30, 1889.	June 30, 1890.
Certificates of deposit.....	\$423,873,298.00	\$471,402,710.00
Public debt and interest.....	17,648,046.50	11,661,087.07
National bank note redemption funds.....	87,691,293.10	61,238,857.75
Discount and discounting accounts.....	22,302,770.34	31,942,896.44
Balance.....	128,097,047.17	170,260,192.30
Total.....	700,643,871.26	757,915,078.94

If the certificates of deposit be set aside, together with the items of debt and interest paid, the net assets, liabilities, and reserve sum up thus:

	June 30, 1880.	June 30, 1890.
Assets	\$326,028,927.81	\$286,384,815.73
Liabilities	127,991,886.64	167,124,718.94
Reserve	198,037,041.17	119,259,097.39

For obvious reasons, the liabilities and reserve of the Treasury do not admit of as clear definition as those of a private financial institution. In a bank, the receipt of money carries with it the obligation to repay a like sum and thus creates a liability. The paying out of money cancels a liability or creates a new asset. The one side of the account is the direct consequence of the other, and of necessity they agree in the aggregate. The reserve is composed of the whole amount of money at immediate command. But with the Treasury, in the collection and disbursement of the public revenues, it is entirely different. Money is received gratis, as it were, and is paid out for no value. In a strictly commercial sense there are no liabilities of the Treasury, and prior to 1878 no periodical statement purporting to be an account of them was ever published. In that year was issued the first of a series of monthly statements, since continued with several changes of form, showing, on the one hand, the cash and other assets, and, on the other, as liabilities, in general, the balance of the deposits lodged in the Treasury for various purposes and the amounts due on account of the public debt and interest. The difference between the totals of assets and liabilities, whether with or without a reserve against the legal-tender notes, as might be the practice for the time being, has been called the balance.

These statements have occupied an ill-defined and shifting position between the accounts of cash in the Treasury and the total funded obligations of the Government, as shown in the debt statement. They have only a relative value in determining the real condition of the Treasury at any time, since they make no mention of actual or prospective receipts and expenditures, and, while setting out with minute exactness so inconsiderable an item of running expense as the interest on the debt, omit altogether, save as advances are made to disbursing officers, the maturing obligations under appropriations of Congress, aggregating perhaps ten times as much. That the field they occupy is vague and the results they show are only partial has been recognized by Congress, which by the act approved July 14, 1890, directed the fund for the redemption of national-bank circulation to be covered into the Treasury and the amount to be reported in the debt statement as debt of the United States. This fund at the time constituted the greater part of the so-called liabilities of the Treasury, exclusive of the outstanding certificates of deposit, and formed a liability as direct as any carried on the Treasurer's books, being for money deposited for the redemption of circulating notes on demand of the holders, a liability in discharge of which upwards of \$22,000,000 was paid out of the Treasury during the last fiscal year.

These remarks are submitted, not for the purpose of detracting from a useful set of public documents, each of which correctly represents the facts admitted within its scope, but rather to show the difficulties in the way of conveying a clear conception of the obligations of the Treas-

ury, and to throw out the caution that, while the statements of assets emanating from this office are true schedules of moneys and credits at the disposal of the Department, any statement of liabilities must be accepted with the qualifications imposed by the limits to which it is confined.

UNAVAILABLE FUNDS.

There has been no change in these funds, the amount of which is \$1,415,433.91, and no authority has been granted by Congress to take them off the books. A statement of them is contained, as usual, in the appendix.

The sum of \$731.11, remaining due from James D. Reymert, formerly receiver of public moneys and depositary of the United States at Falls St. Croix, Wis., heretofore carried as unavailable on the books of the Register of the Treasury, but not charged to the Treasurer's account, was recovered and taken up as a receipt.

THE PUBLIC DEBT.

In the month of July, 1890, the public-debt statement received a revision by which it was brought to exhibit, much more accurately than before, the state of the obligations of the Government properly classified under this head. The alterations made were the exclusion of the principal of the Navy pension fund and of the bonds issued to the Pacific railway companies, together with all interest, whether matured or merely accrued and not yet due, and the addition of the fund on deposit in the Treasury for the redemption of the notes of insolvent national banks and of banks in liquidation or reducing their circulation. The Navy pension fund is in no sense a debt, the principal of \$14,000,000 being the property of the United States, derived from naval prizes and certain penalties and forfeitures. The amount has been covered into the Treasury, under various acts of Congress, with the condition that interest thereon, fixed in 1869 at the rate of 3 per cent. per annum, should be applied to the payment of Navy pensions. In effect, the legislation on the subject amounts simply to a permanent annual appropriation of \$420,000 for certain objects, the employment of a principal sum and a rate of interest being only a means of arriving at the amount. The bonds issued to the Pacific railways were first taken up as a debt of the United States in the statement for March, 1885. Provision has been made by law to secure the Treasury against both principal and interest. The fund for the retirement of national-bank notes was carried from the liabilities of the Treasury to the public debt in accordance with the act of Congress approved July 14, 1890, as before stated. And it must be plain from any point of view that interest, which, although an incident of the debt, has to be provided for out of the annual revenues, like any other current expenditure, should not be treated as standing upon the same footing as so much principal.

The effect of these changes is shown in the following summary statement of the debt, for June 30, 1890, in the two forms:

	Old form.	New form.
Interest-bearing debt.....	\$780,336,622.00	\$711,313,110.00
Matured debt.....	1,815,305.76	1,745,805.26
Debt bearing no interest.....	794,088,821.47	880,639,619.22
Interest.....	9,700,283.07	.....
Total.....	1,595,580,350.80	1,693,759,534.48

Lest any possible ground for misconception should be left, it may be well to state expressly that the alterations apparent in the above figures were not made in consequence of changes of fact, but are due merely to changes in a form of statement. The various obligations of the Government to pay money on demand or at some future time remain the same; they have only been redispensed, some by Congress and others by the Department, with a view of correcting their classification.

Since the published statements relating to the period covered by this report are in the old form, a comparison of the debt and of the condition of the Treasury with relation thereto, for June 30, 1889 and 1890, will be given on the same basis, to avoid needless confusion. By putting together all of the bonded and other obligations of the Government, with the liabilities of the Treasurer upon deposit, redemption, and other agency accounts, and deducting from the aggregate the gross available assets of the Treasury, the following result is obtained:

	June 30, 1889.	June 30, 1890.
Interest-bearing debt.....	\$894,477,502.00	\$789,936,622.00
Old demand notes.....	56,412.50	56,032.50
United States notes.....	346,641,016.00	346,641,016.00
Fractional currency, estimated.....	6,916,690.47	6,911,510.97
Certificates of deposit.....	433,873,298.00	471,492,730.00
Matured debt.....	1,911,488.26	1,815,805.26
Interest due and unpaid.....	1,294,049.82	1,184,794.05
Accrued interest.....	9,434,501.51	8,560,448.02
Total debt.....	1,694,644,983.56	1,626,658,998.80
Treasurer's agency account.....	116,033,489.50	95,581,164.22
Aggregate.....	1,810,678,473.06	1,722,240,163.02
Assets of Treasury.....	760,643,871.26	757,915,078.94
Debt, less cash in Treasury.....	1,050,034,603.80	964,325,084.08

If the certificates of deposit and the interest items, against which a like amount of cash is held, be set aside, together with the liabilities on the Treasurer's agency account, the principal of that part of the debt which rests solely on the credit of the Government may be brought into comparison with the available cash on hand. Condensed into the simplest form on this basis, the above statement is reduced to the following:

	June 30, 1889.	June 30, 1890.
Bonded debt.....	\$896,888,987.26	\$791,762,427.26
Circulating notes.....	354,654,148.97	353,648,596.47
Total.....	1,250,543,136.23	1,145,400,023.73
Available cash.....	290,008,522.43	181,073,962.65
Principal, less cash in Treasury.....	1,059,034,603.80	964,325,084.08

To produce the net reduction of \$104,642,149.50 in the principal of the debt proper, there had to be retired \$5,870 more, for a like amount of new 4 per cent. bonds issued for interest on 4 per cent. refunding certificates converted, so that the total retirement of principal for the year was \$104,648,019.50. This was effected at the cost of \$20,304,224.06 in premiums, making a total application of \$124,952,243.56 toward the extinction of the principal of the debt. Of this sum \$105,314,496.03 was derived from the surplus revenues of the year and \$19,607,747.53 was taken from the cash in the Treasury.

The following statement exhibits the amount of principal retired from the several loans, the cost for premiums, and the total cost:

	Principal.	Premium.	Total cost.
Four and a half per cents.....	\$20,623,250.00	\$1,427,500.87	\$22,050,750.87
Four per cents.....	73,923,500.00	18,876,923.19	92,800,423.19
Matured debt.....	95,680.00		95,680.00
Old demand notes.....	410.00		410.00
Fractional currency.....	5,179.50		5,179.50
Total.....	104,648,019.50	20,304,423.06	124,952,442.56

THE CURRENCY.

Important changes again took place in the circulating medium, but unlike those of the year preceding, they were not all of an unfavorable character. In the fiscal year 1889 there was a loss of nearly twenty-six millions of gold, a gain of thirty-four millions of silver, and a contraction of forty-one millions in the national-bank circulation, resulting in a net decrease of thirty-three millions in the effective stock. The past year witnessed a recovery of fifteen millions of gold, an increase of forty-three millions of silver, and a withdrawal of twenty-six millions of bank notes—a net increase of thirty-two millions in the aggregate supply. The outstanding certificates of deposit, which are rather a vehicle for exchanging the coin and legal-tender notes they represent than a component of the circulation itself, were increased by about thirty-eight millions, as compared with forty-seven millions added the year before.

According to the official estimate of the stock of the precious metals in the country and the amounts of the outstanding issues of paper currency, including the certificates of deposit together with the coin and notes held against them, the circulating medium on June 30, 1889 and 1890, was composed as follows:

	June 30, 1889.	June 30, 1890.
Gold coin and bullion.....	\$280,081,505.00	\$205,563,020.00
Silver dollars and bullion.....	343,547,093.00	387,718,002.00
Fractional silver coin.....	76,091,838.00	77,493,856.00
Total coin and bullion.....	1,100,012,436.00	1,171,774,948.00
State bank notes.....	201,170.00	197,484.00
Old demand notes.....	56,441.50	76,032.50
One and two year notes.....	62,935.00	62,365.00
Compound-interest notes.....	156,750.00	183,460.00
Fractional currency, estimated.....	6,916,690.47	6,911,310.27
National bank notes.....	211,378,963.00	185,718,200.00
United States notes.....	346,683,010.00	346,681,010.00
Certificates of deposit, net of June 8, 1872.....	17,195,000.00	13,396,000.00
Gold certificates.....	154,948,552.00	151,562,970.00
Silver certificates.....	262,629,746.00	301,309,751.00
Total paper currency.....	909,586,184.97	1,011,332,184.47
Aggregate.....	2,009,608,620.97	2,179,107,132.47

While the figures relating to the paper currency are subject to uncertain subtractions for loss from wear and waste, they do not comprise a dollar that will not be redeemed if presented at the proper place. The State bank notes are either the issue of responsible institutions which report them as liabilities, or are provided for by deposits of lawful money with public officers. They are occasionally met with and some of

them are redeemed every year. The old paper issues of the Government are reduced to small amounts, with the exception of the fractional currency, of which, according to the accounts of issues and redemptions, more than fifteen millions are outstanding. There are weighty reasons for believing that by far the greater part of this sum is really extant and that the estimate which placed the amount lost and destroyed at eight millions was excessive. Upon the whole, the aggregate above given can not be far out of the way.

The complicated business of the Treasury and the intimate relations subsisting between that business and the distribution of the circulating medium, have given rise to erroneous notions, not only of what is actually done by the Department, but also of the effect produced thereby upon the currency. But while there is much difficulty in conveying a clear insight of the Treasury operations as a whole, embracing as they do the collection and disbursement of moneys from the revenues, the handling of vast sums for the Post-Office Department and the national banks, the custody of large amounts of coin and legal-tender notes against certificates of deposit, and the application of surplus revenues to the payment of the public debt, as well as the issue of currency, the relations between the Treasury and the circulation are yet of the simplest kind. There is, first, the total volume of the circulating medium in the country as shown in the foregoing statement. This consists not of so-called funds, balances of book accounts, or any other immaterial or abstract conceptions, but, as nearly as can be ascertained, of gold, silver, and circulating notes contained within the borders of the land. Next there is to be considered what portion of the several kinds of this money is in the Treasury; not what the Treasury could collect nor what it owes; here again not funds nor balances nor mental abstractions, but simply and only the sum total of what gold, silver, and notes are in its vaults and cash tills. This is obtained from the count of the cash itself, and is exactly known. If now the amount in the Treasury be taken from the whole amount in the country, the remainder must be the amount in circulation among the people.

In the appendix are given tables showing, among other things, the assets of each of the several offices of the Treasury and Mint, on June 30, 1890, in which the amounts of each kind of money held are minutely set out. These items are collected and aggregated in a succeeding table, and the figures are carried thence into the statement of assets and liabilities of the Treasury, where they appear in the form in which these statements are published monthly. If the figures thus obtained for June 30, 1889 and 1890, be deducted from those representing the total stock of monetary material in the country, and the remainders set out as amounts in circulation, the result will be as follows:

	June 30, 1889.		June 30, 1890.	
	In Treasury.	In circulation.	In Treasury.	In circulation.
Gold	\$303,387,719.79	\$376,875,785.21	\$330,933,145.02	\$374,029,883.98
Silver	314,935,151.52	105,013,772.48	340,020,003.43	116,585,315.57
Old paper issues	1,094.70	7,421,913.21	260.21	7,409,502.28
National bank notes	4,156,537.75	307,228,425.25	4,365,837.45	181,803,752.55
United States notes	47,396,875.54	229,304,140.46	28,882,038.04	323,798,977.96
Certificates of deposit, act of 1872	240,000.00	15,955,900.00	800,000.00	11,890,000.00
Gold certificates	25,918,323.00	117,120,223.00	26,732,120.00	130,810,050.00
Silver certificates	5,487,181.00	227,142,505.00	3,983,513.00	297,556,338.00
Total	713,416,893.30	1,367,551,835.61	727,025,617.75	1,443,083,618.73

It appears, hence, that both the holdings of the Treasury and the circulation increased during the year, the latter to the extent of \$55,500,000. To show the net amount of the gold, silver, and notes belonging to the Treasury and to the public, as determined by actual holdings or by the ownership of certificates of deposit, the certificates in the Treasury cash must be set aside, and those in circulation added to the coin and notes in the hands of the public. Upon this basis the virtual condition of the Treasury and of the circulation was as given below:

	Outstanding.	In Treasury.	In circulation.
<i>June 30, 1889.</i>			
Gold	\$680,063,505.00	\$186,257,490.79	\$403,806,014.21
Silver	420,548,929.00	57,792,586.52	362,756,342.48
Notes	566,482,986.97	34,493,508.05	531,989,478.92
Total	1,666,995,420.97	278,543,585.36	1,387,551,835.41
<i>June 30, 1890.</i>			
Gold	695,563,029.00	190,102,286.02	505,460,742.98
Silver	463,211,919.00	49,070,365.43	414,141,553.57
Notes	839,839,458.47	16,358,136.30	823,481,322.17
Total	1,998,614,406.47	255,530,787.75	1,443,083,618.72

These figures bring out the fact that while the growth of the circulation was real, the increase of cash in the Treasury was only apparent, having been due to the return of certificates of deposit in the revenues. As shown elsewhere, there was a decrease of \$23,000,000 in the net amount of money in the Treasury.

In spite of the large increase of silver, there was a trifling increase in the relative amount of gold. The net stock of gold, silver, and notes, and the amounts in circulation at the end of each of the last five fiscal years were as follows:

	1886.	1887.	1888.	1889.	1890.
<i>Stock.</i>					
Gold	\$590,774,461	\$654,520,305	\$705,818,855	\$680,993,505	\$695,563,029.00
Silver	312,252,843	352,861,506	386,572,835	429,545,929	463,211,919.00
Notes	665,891,618	635,488,036	606,512,959	565,482,986	539,839,458.47
Total	1,568,918,922	1,641,002,937	1,698,904,649	1,676,022,420	1,698,614,406.47
Per cent. of gold	37.7	39.9	41.5	40.8	40.9
<i>Circulation.</i>					
Gold	424,302,950	487,760,118	512,208,892	493,806,014	505,460,742.98
Silver	180,958,838	246,250,693	306,649,367	362,756,342	414,141,553.57
Notes	628,988,895	611,112,956	569,775,984	530,989,478	523,481,322.17
Total	1,234,250,683	1,345,123,767	1,388,634,243	1,387,551,834	1,443,083,618.72
Per cent. of gold	34.5	35.8	37.1	35.6	35.0

In view of the prominence to which the money circulation of the country has risen in public discussion, the time seems opportune for presenting such recent historical facts as would be useful in the forming of an intelligent understanding of the subject. While the archives of this office contain little that would throw light upon the economic or industrial condition of the country or the changes occurring therein at different periods, by which financial legislation may have been deter-

mined, they do embrace the most important, and in some cases the only records existing with relation to the amounts of the several kinds of money in the Treasury and in circulation at various times. Since the beginning of the creation of the present currency system, in 1861, all of the coin and paper that have gone to the composition of the monetary stock of the country have passed through the Treasurer's accounts, with the exception of national bank notes only; while as regards these he has since 1874 been charged with their redemption and with other duties relating to them which have required him to be kept informed of the volume of them outstanding. Hence, these records, with some aid from others in the Department, particularly the official estimates of the general stock of gold and silver at different periods, afford a complete view of the actual conditions and changes through which the currency has passed in the last quarter of a century.

In considering the period of time over which statistics of this sort would be useful for present purposes, the end of the fiscal year 1878 is suggested on various grounds. That is the time which marks approximately the origin of the currency of to-day. The restoration of the paper issues to par, the resumption of specie payments, the return of gold to the country, the re-appearance of the silver coins in circulation, the creation of the standard silver dollar and silver certificate, the retirement of the fractional paper currency, and the fixing of the amount of the legal-tender notes at their present volume, may all be said to date from that era. For these reasons, and because the space of thirteen years will furnish as much matter as it may be desirable to present here, the date named has been selected as the first for which figures should be given.

The tables which have been prepared to carry out this plan will be found in the appendix. They consist, in the first part, of statements of the issues, redemptions, and amounts outstanding, severally by denominations, of the United States notes, currency certificates, gold certificates, and silver certificates, comprising all the live paper issues, for the end of each fiscal year. A final table in this series sums up the amounts of these issues and of the national bank notes outstanding, thus presenting a complete record of the whole paper circulation of the country for the years indicated.

There follow next a number of tables which show the amounts of the several kinds of paper money and of gold and silver in the Treasury, and the amounts of paper money in circulation at the end of each month; also the estimated total stock of gold and silver coin and bullion in the country, the estimated circulation of gold and silver coin, the total actual circulation of all kinds of money, being the total stock less the amounts in the Treasury, and the total Treasury holdings and circulation for the end of each fiscal year from 1878 to 1885, and quarterly thereafter. The insignificant amounts remaining of the earlier paper currency are uniformly neglected. The tables showing the gold, silver, and United States notes in the Treasury, in connection with the certificates of deposit outstanding, are reproduced, as heretofore published, with extensions to September, 1890.

These tables, so far as they relate to the condition of the Treasury, are compiled from the latest reports of the various Treasury offices at hand on the last day of each month, in the same manner as the debt statements are prepared. Where the figures are found to disagree with those relating to the same matter elsewhere in these pages, the difference is one of date, as has been explained in former reports.

UNITED STATES NOTES.

The redemption of legal-tender notes in kind at this office amounted to \$78,132,000, against \$59,450,000 for the year preceding. The redemptions in New York, in gold, were \$732,386, making a total of \$28,198,983 since the resumption of specie payments. A table of issues, redemptions, and amounts outstanding for each fiscal year, beginning with 1878, is given in the appendix.

In the earlier history of the issue of circulating notes by the Government, in times when the rate of emission was limited by the capacity of the press rather than the necessities of the Treasury, it was the practice, in some of the accounts, to treat as issues the daily receipts of new notes from the printers. This had grown into a custom when afterwards the Treasury acquired better control of its resources and when the amounts of unissued notes in the reserve vault reached at times as high as half of those actually circulating as money. The methods were not changed until about 1875; hence the records of issues and redemptions prior to that year have to be studied with care if an exact separation between the effective currency and the paper on hand awaiting issue be sought. No suspicion can be cast upon the integrity of the accounts, which exhibit all the details considered of importance at the time when they were kept; but less attention was then paid to the denominations of paper in circulation than now, and it is not so easy to ascertain the precise facts in this particular from the early as from the later records.

A table of annual issues and redemptions of United States notes, which first appeared in the Treasurer's report for 1836, and was reprinted, with extensions, in the next three years, presents the showing of these accounts as they stand, and consequently, to the end of the fiscal year 1874, the issues set out are those of the printing presses. The amounts derivable from the issues and redemptions as outstanding include the notes in circulation, in the Treasury cash, and in the reserve vault unissued. They disagree with the true volume outstanding, in the sense in which the term is ordinarily understood, for the eleven years beginning with 1864, in the manner here explained, by varying differences, the greatest being in 1871, when the outstanding notes were limited by law to \$356,000,000, while the table would make out \$534,645,459 issued and not yet redeemed. The accounts show that at the time there were new notes on hand not yet put in circulation equal to the difference, and a statement of their denominations is made in the report for that year.

In the belief that the table, even with this explanation, would be misleading rather than useful as statistical matter, it is omitted from the present report, and the earliest figures relating to the issues and redemptions of legal-tender notes given are for 1878. If the subject be deemed of sufficient importance, a full statement of these transactions may be prepared hereafter.

GOLD CERTIFICATES.

There was a decline of activity in the issue and redemption of gold certificates. The handlings were mostly of the large denominations, which are used in the collection of customs and the settlement of clearing-house balances in New York. But \$275,140 of the series of 1863, which was discontinued in December, 1878, remained outstanding on June 30 last, the redemptions of the year having amounted to \$9,740.

The circulation of the current series payable to bearer, in denominations of from \$20 to \$10,000, was expanded to the extent of about \$10,000,000, while that of those payable to order, of the denomination of \$5,000 and \$10,000, was contracted by some \$6,500,000.

The table following exhibits the aggregate annual transactions in the issue and redemption of these certificates:

Fiscal year.	Issued during fiscal year.	Total issued.	Redeemed during fiscal year.	Total redeemed.	Outstanding at close of fiscal year.
1866	\$58,493,600.00	\$98,493,600.00	\$87,545,800.00	\$87,545,800.00	\$10,947,800.00
1867	19,121,820.00	267,615,280.00	101,295,900.00	188,841,700.00	18,773,580.00
1868	77,980,400.00	285,576,080.00	79,055,310.00	267,897,040.00	17,678,640.00
1869	80,663,100.00	366,238,840.00	65,255,620.00	333,152,680.00	33,086,160.00
1870	76,731,000.00	442,969,900.00	75,270,120.00	408,422,780.00	34,547,120.00
1871	58,577,000.00	499,546,900.00	71,237,820.00	479,690,000.00	19,856,900.00
1872	63,229,500.00	562,776,400.00	51,029,500.00	539,690,100.00	23,086,300.00
1873	55,570,500.00	618,346,900.00	48,100,800.00	578,890,900.00	39,460,000.00
1874	81,117,780.46	699,464,680.46	97,752,680.46	676,638,580.46	22,825,100.00
1875	70,250,100.00	769,714,780.46	71,278,900.00	747,918,480.46	21,796,300.00
1876	90,618,100.00	860,333,880.46	83,734,000.00	831,652,480.46	28,681,400.00
1877	58,141,100.00	918,475,080.46	45,250,000.00	876,902,480.46	41,572,600.00
1878	50,342,400.00	968,817,480.46	47,548,000.00	924,450,480.46	44,367,000.00
1879	12,317,400.00	981,134,880.46	41,270,700.00	965,721,180.46	15,413,700.00
1880		981,134,880.46	7,409,100.00	973,130,280.46	8,004,600.00
1881		981,134,880.46	2,221,680.00	975,351,960.46	5,782,920.00
1882		981,134,880.46	745,800.00	976,097,760.46	5,037,120.00
1883	89,710,000.00	1,070,844,880.46	9,368,400.00	985,466,240.46	82,378,640.00
1884	41,470,000.00	1,169,314,880.46	25,475,080.00	1,019,922,220.46	98,392,660.00
1885	63,603,000.00	1,172,914,880.46	21,069,520.00	1,031,991,700.46	140,323,140.00
1886	1,040,600.00	1,173,954,880.46	10,188,895.00	1,042,180,635.46	131,174,245.00
1887		1,173,954,880.46	9,687,428.00	1,051,868,063.46	121,486,817.00
1888	85,160,000.00	1,258,514,880.46	64,623,067.00	1,116,491,730.46	142,023,150.00
1889	79,275,000.00	1,337,789,880.46	67,240,508.00	1,183,741,238.46	154,048,552.00
1890	49,050,000.00	1,386,839,880.46	45,553,573.00	1,229,296,901.46	157,542,979.00

STANDARD SILVER DOLLARS AND SILVER CERTIFICATES.

The absorption of legal-tender silver into the circulation, through the vehicle of the certificate of deposit, has been kept in check only by the limit of the means of supply at the disposal of the Treasury. The fresh issues of certificates called for took up the year's coinage and \$3,000,000 more. This currency now furnishes almost the entire circulating medium of the lower denominations. The whole amount of the coins and certificates in circulation on the 30th of June was upwards of \$353,000,000, with only \$16,000,000 in the Treasury to draw upon for the supply always demanded in the autumn months.

The yearly coinage and movement of the dollars are shown in the following table:

Fiscal year.	Annual coinage.	Total coinage.	On hand at close of year.	Net distribution during year.	Outstanding at close of year.	Percentage of annual coinage distributed.	Percentage of total coinage outstanding.
1878	48,573,500	\$8,573,500	\$7,718,357	\$855,143	\$855,143	9.9	9.9
1879	27,227,500	35,801,000	28,147,351	6,798,500	7,653,619	21.9	21.3
1880	27,935,750	63,734,750	44,425,315	11,655,788	19,309,435	41.7	30.2
1881	27,637,955	91,372,705	62,544,722	9,514,548	28,827,983	31.4	31.5
1882	27,772,677	119,144,789	67,153,816	3,162,981	31,490,984	11.3	26.8
1883	28,111,119	147,255,899	111,914,019	3,350,916	35,241,880	11.9	24.0
1884	28,040,930	175,355,829	135,560,916	4,453,693	39,794,813	15.8	22.6
1885	28,528,552	203,884,381	165,413,112	1,323,644	38,471,269	.....	18.8
1886	29,238,905	233,723,296	181,253,560	13,908,451	52,469,729	46.9	22.4
1887	32,266,811	266,980,117	211,483,970	3,006,427	55,506,147	9.1	20.7
1888	32,434,673	299,421,790	233,879,487	39,136	55,545,303	0.1	18.5
1889	33,997,800	333,422,650	279,084,683	1,207,336	54,337,967	.....	16.3
1890	35,979,816	369,402,466	313,259,910	1,804,589	56,142,556	5.0	15.2

CERTIFICATES OF DEPOSIT, ACT OF JUNE 8, 1872.

These certificates, variously known also as clearing-house certificates, legal-tender certificates, or currency certificates, are issued in denominations of \$5,000 and \$10,000, from this office and from the sub-treasuries in New York, Boston, Philadelphia, Baltimore, Cincinnati, Chicago, and St. Louis, under section 5193 of the Revised Statutes, which authorizes the Secretary of the Treasury to receive United States notes on deposit, without interest, from any national bank, in sums of not less than \$10,000, and issue certificates therefor, payable on demand, in United States notes, at the places where the deposits were made. The notes received are required to be held as a special deposit for the redemption of the certificates, and the latter may be counted as part of the lawful-money reserve of the banks, and be used in the settlement of clearing-house balances at the place of issue. Being payable to the order of the depositor and transferable by indorsement, these certificates afford a convenient means, particularly to national banks, of carrying or exchanging large sums. Although differing in some respects from the ordinary circulating notes, they perform many important functions of money, and no clear view of the complicated existing system of circulation can be obtained if they be left out of sight. They are, therefore, included in the tables of circulation and Treasury holdings given in the appendix.

Little attention has been given to these certificates in former reports, and little relating to them can be gathered from printed documents, more than the total annual issues and redemptions and the amounts outstanding at various periods. To supply this lack, a statement of the issues, redemptions, and amounts outstanding, by denominations, for the end of each fiscal year since their issue began, is given in the appendix. The figures will be found to differ at times from those heretofore published, the principal variation arising from the fact that \$6,500,000 of unissued certificates, destroyed in the fiscal year 1876, after the retirement of a Treasurer from office, and treated at the time as having been issued and redeemed, were for a number of years, beginning with 1881, dropped from both sides of the account. They are now replaced in order to reconcile the printed figures with the records of the Department. The differences between the denominational tables and the statements of assets and liabilities, in the amounts outstanding, are due to the fact that the former are compiled from weekly, and the latter from daily, reports to this office.

FRACTIONAL SILVER COIN.

There has been a further outflow from the Treasury, without return of between two and three millions in silver pieces of the value of 10, 25, and 50 cents, indicating that the growth of this circulation has not yet been arrested. The decrease in the Treasury holdings of half-dollars, the stock of which is redundant, amounted for the fiscal year to half of the total decrease. Doubtless, with judicious management and the expenditure necessary for the recoinage of worn pieces, the whole stock of the metal in these coins can, in the course of a few years more, be given employment. Such a result would be a great advantage to the Treasury, not only in relieving the vaults of a cumbersome asset, but also in clearing the cash of a considerable sum of inconvertible currency of limited legal-tender value.

The amounts of the different pieces in the several offices of the Treasury and mint on June 30, 1890, were as follows:

Office.	Fifty cents.	Twenty-five cents.	Twenty cents.	Ten cents.	Five cents.	Three cents.	Unassorted.
Treasurer U. S., Washington...	\$1,426,790.00	\$563,460.00	\$40.00	\$2,875.00	\$669.85	\$62.73	\$54,845.10
Assistant Treasurer U. S.:							
Baltimore	359,600.00	46,150.00		13,600.00	50.00	30.00	16,358.10
Boston	317,767.00	95,220.00	100.00	10,201.25	809.00	102.00	34,656.30
Chicago	781,000.00	213,000.00		17,000.00			106,986.00
Cincinnati	183,000.00	181,155.00	28.00	19,000.00	402.00	28.00	1,594.00
New Orleans	140,490.00	130,070.00	117.00	11,265.00	1,330.40	16.53	4,490.45
New York	8,327,000.00	699,000.00		42,000.00			158,823.19
Philadelphia	313,000.00	49,000.00	300.00	7,000.00	1,100.00	60.00	233,137.67
San Francisco	6,260,315.50	120,134.75	363.00	33,146.60	3,276.70	900.00	
St. Louis	937,300.00	114,650.00	50.00	17,200.00	300.00		37,018.48
Mint U. S.:							
Carson City	21.00	509.50		902.23			
Denver							
New Orleans							.28
Philadelphia	4,972.00	645.00		9,434.63			
San Francisco		263,531.75		30,652.49			
U. S. Assay Office:							
Helena							144.69
New York	1.50	11.75		101.50			
St. Louis							1.90
In transit	50,000.00	327,000.00					272.05
Total	19,107,287.00	2,803,537.75	998.00	223,378.65	7,988.95	1,109.20	648,328.18

MINOR COIN.

The amount of copper and nickel coins in circulation throughout the country is uncertain. No authoritative estimate of it exists, and the difficulties of the subject are such that conjectures would be entitled to little weight. The official record of coinages and remeltings shows that some \$20,000,000 of the pieces issued from the mint have not been returned, but this residue can only be taken as representing the sum of the existing stock and the loss and wear of a century. In the estimates of the circulation given elsewhere in this report, the amounts of these coins in the Treasury are alone included. The rapid coinage made necessary of recent years by the demands of the public indicates a spread of the use of the smaller coins to communities where they were formerly unknown. The following table shows the amounts of the several denominations in the Treasury at the end of the fiscal year:

Office.	Five cents.	Three cents.	Two cents.	One cent.	Unassorted.	Total.
Treasurer U. S., Washington	\$7,290.00	\$90.00	\$20.00	\$4,670.00	\$668.81	\$12,758.81
Assistant Treasurer U. S.:						
Baltimore	2,650.00	30.00	30.00	6,735.00	232.46	9,677.46
Boston	6,503.00	189.00	85.00	676.00	252.49	7,707.49
Chicago	16,200.00	90.00		14,710.00	490.83	31,450.83
Cincinnati	3,378.00	460.00	110.00	817.00	18.11	4,753.11
New Orleans	4,413.00	7.62	6.06	668.94	.12	5,098.64
New York	33,091.00	570.00	400.00	32,680.00	1,017.06	67,758.06
Philadelphia	11,050.00	90.00	200.00	130.00	5,248.01	16,758.01
San Francisco	6,530.43	43.23	123.50	2,582.83	237.67	9,282.01
St. Louis	4,800.00	30.00	20.00	1,250.00		6,330.67
Mint U. S., Philadelphia					22,863.49	22,863.49
U. S. Assay Office:						
Denver					.31	.31
New York					21.12	21.12
St. Louis					9.65	9.65
Total	95,909.45	1,599.85	997.40	64,959.77	39,598.13	194,462.66

At present this coinage serves its purpose in a very satisfactory manner. It is perhaps in better condition and in more convenient supply than any other part of the currency. The recent act of Congress discontinuing the 3-cent nickel piece, it is to be hoped, will permanently retire that vexatious denomination, which, after three experiments, in silver, paper, and base metal, has failed to perform the fanciful duty for which it was designed, or to commend itself in any other way to popular favor. It is, in fact, out of place in a decimal system of money.

RECOINAGE OF UNCURRENT COINS.

The sum of \$29,206.93, out of \$30,000 appropriated by Congress, was applied to the recoinage of silver coins. For this purpose the following lots were transferred to the mint, where they were melted and fabricated into dimes:

Denomination.	Amount.
Fifty cents.....	\$331,720.86
Twenty-five cents.....	213,775.00
Twenty cents.....	1,652.25
Ten cents.....	41,286.00
Five cents.....	11,321.25
Three cents.....	500.00
Total fractional silver coin.....	608,165.36
Standard dollars.....	43,161.00
Trade dollars.....	614.58
Total.....	651,940.94

There was also transferred \$45,796.95 of minor coins to be recoined or cleaned.

On June 30 last uncurrent gold and silver coins were held in the several offices of the Treasury as follows:

Office.	Gold coin.	Standard silver dollars.	Fractional silver coin.
Washington.....	\$25,385.35		\$47,700.00
Baltimore.....		\$100	15,000.00
New York.....	370,000.00		110,000.00
Philadelphia.....		2,500	217,000.00
Boston.....	401,873.00	1,000	23,500.00
Cincinnati.....			854.00
Chicago.....	40,555.00		105,000.00
St. Louis.....		950	30,400.00
New Orleans.....			4,905.00
San Francisco.....	2,955.00	74	257,597.93
Total.....	939,739.35	4,624	818,017.93

Besides these the \$6,000,000 of 50-cent pieces in the sub-treasury at San Francisco are all much worn. The appropriation of \$20,000 for this year will be sufficient for the recoinage of only \$450,000 of silver, leaving untouched all the gold and half the silver that were uncurrent and on hand when the money became available. It would appear to be wise policy not to neglect the coin circulation for any length of time, but to provide each year for the expenses of keeping it in condition. To this end a permanent appropriation should be made of as much as may be found necessary.

WORK OF THE OFFICE.

No great changes have occurred in the routine business other than those incident to the increase of the revenues. The immense operations of the year were accomplished by the movement of \$100,000,000 less money in and out of the several offices than was found necessary the year preceding. Improvements of methods have been introduced where possible, as, for example, the use of a perforating punch for preventing alteration of drafts and checks.

Before closing this report the Treasurer desires to express the sense which he entertains of the high value of the services rendered by the officers and employes associated with him. To the honesty, competency, and industry of the entire force it is due in a great measure that the vast business of the year, including the work of supplying almost all the currency of 62,000,000 of people, was conducted without the loss of a cent. Special acknowledgments are due to Mr. J. W. Whelpley, Assistant Treasurer; Mr. E. R. True, cashier; Mr. J. F. Meline, assistant cashier; Mr. T. E. Rogers, Superintendent of the National Bank Redemption Agency; Mr. A. L. Rutter, chief clerk; Messrs. J. C. Burnett, D. W. Harrington, C. L. Jones, Albert Relyea, and Ferdinand Weiler, chiefs of division; Messrs. W. H. Gibson and G. C. Bantz, tellers; and Mr. Sherman Platt, principal book-keeper. The statistical and other matter contained in this report has been compiled and prepared for publication with the assistance of Mr. F. W. Lantz.

I have the honor to be, very respectfully, your obedient servant,

JAMES N. HUSTON,
Treasurer of the United States.

HON. WILLIAM WINDOM,
Secretary of the Treasury.

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REPORT OF THE COMMISSIONER OF INTERNAL REVENUE.

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ILLICIT STILLS SEIZED.

The following statement shows the number of illicit stills seized, persons arrested, and casualties to officers and employes during the fiscal year ended June 30, 1890:

Districts.	Stills seized.		Number of persons arrested.	Casualties.	
	Destroyed.	Removed.		Killed.	Wounded.
Alabama.....	80	6	62		
Arkansas.....	7	2	11		
Florida.....		3	8	1	
Georgia.....	88	59	172		
Illinois.....		1			
Iowa.....	1				
Kansas.....	7		3		
Second Kentucky.....	3				
Third Kentucky.....	4		3		
Fourth Kentucky.....	24	8	7		
Louisiana.....	1		11		
Michigan.....	1		1		
New Mexico.....		1			
First New York.....		1	1		
Fourth North Carolina.....	77	23	23		11
Fifth North Carolina.....	67	4	10		

* Deputy Collector Frank Weller, killed August 14, 1890.

† Revenue Agent Sanford Kirkpatrick, wounded February 25, 1890.

Districts.	Stills seized.		Number of persons arrested.	Casualties.	
	Destroyed.	Removed.		Killed.	Wounded.
Tenth Ohio.....		1			
Twenty-third Pennsylvania.....		1	1		
South Carolina.....	24	7	17		
Second Tennessee.....	8		6		
Fifth Tennessee.....	22		16		
Sixth Virginia.....	31	9	21		
West Virginia.....	1	1	2		
First Wisconsin.....	1		1		
Total.....	456	127	382	1	1

STILLS SEIZED AND CASUALTIES TO OFFICERS AND EMPLOYEES FOR THE LAST ELEVEN YEARS.

	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
Stills seized.....	909	750	464	397	377	245	564	456	618	408	599
Officers and employes killed.....	3	1	4	1		1			1	1	1
Officers and employes wounded.....	7	9	1		1		1	1	1	2	1

TOBACCO DIVISION.

The aggregate amount of taxes collected from tobacco during the last fiscal year was \$33,958,991.06. This amount includes internal-revenue taxes paid by stamps on imported manufactured tobacco, snuff, cigars, and cigarettes.

The increase of collections for the last fiscal year over those for the previous fiscal year was, from—

Manufactured tobacco.....	\$1,243,581.42
Snuff.....	92,641.70
Cigars and cheroots.....	661,513.83
Cigarettes.....	40,796.66

Total increase of collections..... 2,043,532.81

The increase in the quantity of tobacco and snuff and in the number of cigars and cigarettes for the last fiscal year over those taxed during the previous fiscal year was:

Manufactured tobacco..... pounds..	15,607,228
Snuff..... do.....	1,158,921

Total..... do..... 16,766,200

Cigars and cheroots..... number..	220,504,343
Cigarettes..... do.....	81,739,320

Total..... do..... 302,243,663

The export account shows a decrease in manufactured tobacco of 771,708 pounds, an increase in the number of cigars exported of 1,551,125, and an increase of the number of cigarettes exported of 12,630,300.

COMPARATIVE STATEMENT.

The following exhibit shows in detail the receipts for the fiscal year ended June 30, 1890, from each particular source of the tobacco tax, as compared with those for the previous fiscal year.

REPORT OF THE SECRETARY OF THE TREASURY. 111

RECEIPTS FROM TOBACCO AND SNUFF.

Manufactured tobacco.....	\$18,325,481.36
Snuff.....	737,731.27
Total for year ended June 30, 1890.....	19,063,212.63
Total for year ended June 30, 1889.....	17,721,989.51
Increase in collections.....	1,341,223.12

The increase in collections from chewing and smoking tobacco was \$1,248,581.42, and from snuff \$92,641.70.

RECEIPTS FROM CIGARS AND CIGARETTES.

Cigars and cheroots.....	\$12,263,669.95
Cigarettes.....	1,116,627.34
Total for year ended June 30, 1890.....	13,380,297.29
Total for year ended June 30, 1889.....	12,677,957.60
Increase in collections.....	702,339.69

Of this increase \$661,513.03 was on cigars and \$40,796.66 was on cigarettes.

RECEIPTS FROM SPECIAL TAXES.

Manufacturers of cigars.....	\$122,896.49
Increase, manufacturers of cigars.....	2,700.96
Manufacturers of tobacco.....	5,197.50
Increase, manufacturers of tobacco.....	69.25
Dealers in manufactured tobacco.....	1,331,118.24
Increase, dealers in manufactured tobacco.....	51,102.31
Dealers in leaf tobacco.....	44,492.40
Decrease, dealers in leaf tobacco.....	4,349.32
Peddlers of tobacco.....	11,776.51
Decrease, peddlers of tobacco.....	925.37

PRODUCTION OF TOBACCO, SNUFF, CIGARS, AND CIGARETTES.

The production of tobacco, snuff, cigars, and cigarettes for the fiscal year ended June 30, 1890, computed from the receipts from stamps sold for all such goods as were put on the market for consumption, together with those removed in bond for export, and including importations, was—

TOBACCO AND SNUFF.

	Pounds.
Tobacco.....	229,068,517
Snuff.....	9,221,641
Total tobacco and snuff taxed.....	238,290,158
Tobacco and snuff exported.....	12,850,702
Total production for fiscal year 1890.....	251,140,860
Deduct imported tobacco and snuff.....	324,969
Total domestic production.....	250,815,891
Total production, 1889.....	235,147,279
Less imported.....	303,595
	234,843,684
Total increase over fiscal year 1889.....	15,972,207

The increase of taxed tobacco and snuff over fiscal year 1889 was 16,765,289 pounds; the decrease of tobacco exported was 771,708 pounds; the decrease of tobacco imported and withdrawn for consumption was 21,374 pounds.

CIGARS AND CHEROOTS.

	Number.
Cigars and cheroots taxed.....	4,087,880,982
Add quantity exported.....	3,250,450
Total taxed and exported.....	4,091,140,432
Deduct quantity imported 1890 (estimated average 12 pounds per 1,000) ..	101,145,999
Total domestic production 1890.....	3,989,994,434
Taxed in 1889.....	3,867,385,640
Exported in 1889.....	1,699,325
Total for 1889.....	3,869,084,965
Less imported.....	102,102,992
	3,766,981,973
Increase over fiscal year 1889.....	223,012,461

CIGARETTES.

Cigarettes taxed.....	2,233,254,680
Add cigarettes exported.....	250,310,660
Total taxed and exported.....	2,482,564,730
Deduct cigarettes imported (estimated average, 3 pounds per 1,000) ..	3,397,000
Total product for fiscal year 1890.....	2,489,167,730
	Number.
Taxed in 1889.....	2,151,515,360
Exported in 1889.....	246,679,750
Total taxed and exported 1889.....	2,398,195,110
Less imported.....	2,286,730
	2,395,908,380
Increase over fiscal year 1889.....	93,259,350

The increase of taxed cigars was 220,504,343; of cigars exported, 1,551,125; and the increase of cigars imported and withdrawn for consumption was 956,993.

The increase of taxed cigarettes was 81,739,320; of cigarettes exported, 12,630,300; and the decrease of cigarettes imported was 1,110,270.

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REPORT OF THE COMPTROLLER OF THE CURRENCY.

DEPARTMENT OF THE TREASURY,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, D. C., December 1, 1890.

SIR: In compliance with the provisions of section 333 of the Revised Statutes of the United States, I have the honor to submit for the consideration of Congress the twenty-eighth annual report of the Comptroller of the Currency, covering the operations of this bureau for the year ended October 31, 1890.

During the year 1865 nearly all banks in the United States operating under the laws of the several States entered the national system; hence, the accessions for that year were abnormally large. The number of associations added to the system during the period covered by this report is greater than for any other twelve months since that date. A larger number of associations are now in operation than ever before,

and the additions made since the last annual report to the surplus and undivided profits of the banks composing the system evidence the fact that they have never been more worthy of public confidence than at the present time. A substantial increase in deposits and loans is also apparent. Comparatively few associations have gone into voluntary liquidation, and only a moderate number have become insolvent. Of those whose corporate existence would have expired during the report year a very large proportion have been granted extensions under the act of July 12, 1882. Viewed as a whole, the operations of the year have been attended with a gratifying degree of success.

Shareholders have, as a rule, received satisfactory returns upon their investments, and the people at large have been faithfully served. The growth of the system furnishes indubitable proof that it is admirably adapted to the requirements of a commercial people, and that its merits are becoming more generally recognized and appreciated.

No legislation affecting national banks has taken place during the period covered by this report.

Within the year 307 banks have been organized, having an aggregate capital of \$36,250,000. The number of banks in existence October 31, 1890, was 3,567, having in capital stock \$659,782,865; bonds deposited to secure circulation, \$140,190,900; and bank notes outstanding, \$179,755,643, including \$54,796,907 represented by lawful money deposited to redeem circulation still outstanding.

The following table gives the number of banks organized during the year ended October 31, 1890, in each State and Territory, with their aggregate capital:

States and Territories.	No. of banks.	Capital.	States and Territories.	No. of banks.	Capital.
Texas.....	63	\$5,950,000	Massachusetts.....	3	\$350,000
Pennsylvania.....	27	2,315,000	Indiana.....	3	450,000
Missouri.....	20	4,400,000	District of Columbia.....	3	800,000
Nebraska.....	10	1,825,000	Vermont.....	3	175,000
Washington.....	18	1,550,000	North Dakota.....	3	400,000
Oregon.....	12	1,000,000	Utah.....	3	950,000
Illinois.....	10	1,725,000	Oklahoma.....	3	200,000
Iowa.....	9	1,750,000	Maine.....	2	100,000
New York.....	8	1,000,000	Minnesota.....	2	300,000
Colorado.....	8	2,000,000	Virginia.....	2	100,000
Wisconsin.....	6	525,000	Georgia.....	2	150,000
Kentucky.....	7	600,000	North Carolina.....	2	150,000
Tennessee.....	7	1,350,000	Wyoming.....	2	125,000
Maryland.....	7	750,000	Arizona.....	2	100,000
Oregon.....	7	450,000	Indian Territory.....	2	150,000
Montana.....	6	1,050,000	West Virginia.....	1	125,000
New Jersey.....	5	300,000	Florida.....	1	100,000
Alabama.....	5	350,000	Arkansas.....	1	50,000
Kansas.....	5	1,300,000	New Mexico.....	1	50,000
South Dakota.....	5	275,000			
Michigan.....	5	435,000			
Louisiana.....	4	650,000	Total.....	307	\$6,250,000

In the Comptroller's report for 1889 a similar table was given showing an accession of 211 banks located in 38 different States and Territories. The increasing popularity of the system will be apparent when it is observed that during the present report-year 307 new associations have joined the system, and that these are distributed among 41 States and Territories. Texas, with 63 new banks, again heads the list, followed in the order named by Pennsylvania, Missouri, Nebraska, and Washington. It is worthy of note that these States were the first five on the list in the report of last year, and in the same order, except that Missouri has advanced from fifth to third place.

Further comparisons with the report of 1889 exhibit the following suggestive changes of position in the list of accessions. Ohio has advanced from the twentieth place, with 4 new banks, to sixth place, with 13 organizations, while New York, which last year occupied the twenty-second place, with 3 accessions, now ranks ninth, with 8 new associations. This indicates that the system has maintained, and is increasing its hold upon the business communities of the leading States east of the Mississippi River, as well as in those located farther west and south. In Kentucky and Kansas smaller proportionate increases are noted. Other changes in position are not especially noticeable.

In this connection it is proper to call attention to the important accessions to the system in St. Louis and other Western reserve cities by the conversion of several conspicuous State banks and the original organization of others with ample capital. The recent rapid increase in the number of associations located in the Southwest and Northwest has done much to bring about these changes, and no doubt similar influences have caused Minneapolis and St. Paul to take their places in the list of reserve cities. The city of Brooklyn has also been placed in this category.

It thus appears that the persistent attacks made upon the national system, based, as a rule, upon misinformation and mainly incited by baseless prejudices, have failed to bring about its destruction or prevent its steady, indeed, rapid extension in all parts of the United States. The involuntary confidence reposed by the people at large in the associations of which it is composed, growing stronger each succeeding year, has at last compelled their establishment in many communities long falsely taught to regard them as instruments of oppression and inimical to the public good. So the material and financial interests of the citizen prove, in time, more potent than the political prejudices of the partisan.

The following table exhibits the number of banks organized, failed, and in voluntary liquidation, and the net increase numerically each year since 1863.

NUMBER AND AUTHORIZED CAPITAL OF BANKS ORGANIZED AND THE NUMBER AND CAPITAL OF BANKS CLOSED IN EACH YEAR ENDED OCTOBER 31 SINCE THE ESTABLISHMENT OF THE NATIONAL BANKING SYSTEM, WITH THE YEARLY INCREASE OR DECREASE.

Year.	Organized.		Closed.				Net yearly increase.		Net yearly decrease.	
			In voluntary liquidation.		Insolvent.					
	No.	Capital.	No.	Capital.	No.	Capital.	No.	Capital.	No.	Capital.
1863.....	134	\$16,378,700					134	\$16,378,700		
1864.....	459	79,366,950	3				459	79,366,950		
1865.....	1014	242,542,982	0	\$330,000	1	\$50,000	1,007	242,162,982		
1866.....	62	8,515,150	4	650,000	2	500,000	56	7,365,150		
1867.....	10	4,260,000	12	2,160,000	0	1,170,000		200,000		
1868.....	12	1,210,000	18	2,445,500	4	410,000			10	\$1,645,500
1869.....	9	1,500,000	17	3,372,710	1	50,000			9	2,922,710
1870.....	22	2,736,000	14	2,560,000	1	250,000	7			64,000
1871.....	170	12,519,000	11	1,450,000			159	18,069,000		
1872.....	173	18,988,000	11	2,180,500	6	1,806,100	156	15,001,400		
1873.....	68	7,692,700	21	3,524,700	11	3,825,000	36	253,000		
1874.....	71	8,745,500	20	2,785,000	3	250,000	48	3,700,500		
1875.....	107	12,104,000	28	3,520,200	5	1,000,000	64	7,263,800		
1876.....	36	5,180,000	32	2,505,000	9	265,000			3	340,000
1877.....	29	2,580,000	26	2,523,500	10	3,344,000			7	3,304,500
1878.....	24	2,775,000	41	4,237,500	14	3,612,500			27	4,075,000
1879.....	38	3,595,000	33	3,700,000	8	1,200,000			3	1,385,000
1880.....	57	8,274,170	9	570,000	3	700,000	45	8,194,170		
1881.....	66	9,051,050	20	1,920,000			50	7,131,050		

NUMBER AND AUTHORIZED CAPITAL OF BANKS ORGANIZED, ETC.—Continued.

Year.	Organized.		Closed.				Net yearly increase.		Net yearly decrease.	
			In voluntary liquidation.		Insolvent.					
	No.	Capital.	No.	Capital.	No.	Capital.	No.	Capital.	No.	Capital.
1882	327	\$30,039,300	78	\$16,120,000	3	\$1,561,300	140	\$12,357,000	.....	.....
1883	367	38,454,350	40	7,730,000	2	250,000	270	20,668,350	.....	.....
1884	194	16,942,300	30	3,647,200	11	1,283,000	150	11,109,980	.....	.....
1885	145	16,938,000	23	17,856,500	4	600,000	20	.....	81,518,500	.....
1886	174	21,358,000	25	1,651,100	8	650,000	141	19,950,000	.....	.....
1887	235	30,346,000	25	2,537,450	8	1,500,000	192	20,458,550	.....	.....
1888	122	12,653,000	34	4,171,000	8	1,900,000	90	5,982,000	.....	.....
1889	211	21,240,000	41	4,316,000	2	350,000	168	16,674,000	.....	.....
1890	207	36,250,000	50	5,050,000	9	750,000	248	30,450,000	.....	.....
Total	4,455	662,763,182	780	163,945,000	139	26,958,900	3,635	516,100,752	69	14,245,500
Deduct decrease	.....	.....	.....	.....	.....	.....	80	14,245,500	.....	.....
Total net increase	.....	.....	.....	.....	.....	.....	*2,500	151,858,282	.....	.....

* One bank restored to solvency, making 3,567 going banks.

* The total authorized capital stock on October 31, was \$680,782,863; the paid-in capital, \$650,355,700, including the capital stock of liquidating and insolvent banks which have not deposited lawful money for the retirement of their circulating notes.

In the foregoing table it will be seen that the net increase in the number of associations during the year, after deducting the failed and liquidating, is 248, as compared with 168 the previous year, and 127 the average of the preceding ten years.

When the difficulties with which national banking associations are obliged to contend are duly considered, the continued growth of the system at an accelerating rate is remarkable. In spite of the fact that they are subjected to onerous requirements in connection with the issue of circulating notes, which has become unremunerative, they still find themselves obliged to maintain their national character, in obedience to the desires of the public at large, which places security and economy above all other considerations in choosing the institutions through which its banking operations are to be conducted.

It would seem to be at variance with public duty to further delay granting such a just measure of relief as would properly facilitate the establishment of these necessary agencies at all points within the national domain where banking facilities are now inadequate.

It is capable of demonstration that the relief required is in entire harmony with the best interests of all, and that the burdens now unnecessarily and unjustly imposed rest at last upon the productive industries of the country.

AMENDMENTS TO PRESENT LAW.

In his report for 1889 the Comptroller called attention to the fact that the issuing of circulating notes by national banking associations was unprofitable. A majority of the banks are receiving no gain from this source, while many of them are suffering a slight loss. This results from the high rate of premium established in the market upon the bonds of the United States available for the purpose of securing note issues. He then used the following language:

In the opinion of the Comptroller the law governing national banks should be amended so as to produce the following modifications:

(1) The minimum deposit of bonds to secure circulation should be fixed at 10 per cent. of the capital stock in respect to all associations having a capital of \$300,000

or less, and for all banks having a greater capital a minimum deposit of \$20,000 in bonds should be required.

(2) Circulation should be issued to the par value of the bonds deposited.

(3) The semi-annual duty on circulation should be so reduced as to equal one-fourth of 1 per cent. per annum.

These recommendations are renewed at the present time, without modification, except as to the first proposition, which might be so changed as to fix the minimum of bond deposit at the nominal sum of \$1,000 for each association without reference to the amount of its capital stock paid in.

The recommendations above quoted were made before the assembling of the present Congress, and prior to the passage of the act of July 14, 1890, providing for the monthly purchase of 4,500,000 ounces of silver bullion, and the issue of Treasury notes in payment therefor. The opinion had generally obtained that the amount of money then in circulation was insufficient and it was presumed by the Comptroller that Congress would not favorably consider so radical a change as the reduction of the minimum bond deposit of each association to \$1,000, until provision had been made for additional circulation of some character.

The passage of the bill above mentioned, authorizing the issue of notes in payment for silver bullion, is generally accepted as indicating the adoption of a new and permanent policy on the part of the General Government, and as tantamount to a declaration that the national banks are not to be made use of in the immediate future to supply the country with the additional circulation required.

This opinion is strengthened by consideration of the fact that bills formulated with great care and early introduced in Congress, providing for an increased and permanent issue of national-bank notes, have not been seriously considered in the Congressional committees having jurisdiction of the subject-matter.

Whatever may be thought as to the expediency of the course above indicated, it is the part of wisdom to promptly adjust matters to the new conditions. If it is true that bank notes are not now needed in providing the money supply necessary to the proper conduct of the business of the country, then there is no just reason for continuing the enforced issue required by existing laws. In recognition of this fact, a bill (S. 3842) was reported to the Senate by Hon. John Sherman, from the Committee on Finance, on the 15th day of July last, reading as follows:

Be it enacted, etc., That the compulsory requirement of deposits of United States bonds with the Treasurer of the United States by national banks is hereby limited in amount to one thousand dollars of bonds for each and every national bank: *Provided,* That the voluntary withdrawal of bonds for the retirement of national-bank notes shall not exceed the sum of three million dollars in any one month: *And further provided,* That this act shall not apply to the deposit of bonds which may be required by the Secretary of the Treasury to secure deposits of public moneys in the national banks.

SEC. 2. That upon any deposit already or hereafter made of any United States bonds bearing interest in the manner required by law, any national-banking association making the same shall be entitled to receive from the Comptroller of the Currency circulating notes of different denominations in blank, registered and countersigned as provided by law, not exceeding in the whole amount the par value of the bonds deposited: *Provided,* That at no time shall the total amount of such notes issued to any such association exceed the amount at such time actually paid in of its capital stock.

SEC. 3. That all acts and parts of acts inconsistent with the provisions of this act be, and the same are hereby, repealed.

It will be observed that the bill provides:

(1) That no association shall be required to maintain a bond deposit of more than \$1,000 to secure circulation.

(2) That every association may issue circulation equal to the par value of its bonds so deposited.

(3) That the monthly withdrawal of bonds under the act shall not exceed \$3,000,000 in the aggregate.

Under all the circumstances the Comptroller has no hesitation in earnestly recommending the passage of this bill.

It is a well-known fact that the circulation of national banks is in process of retirement. During the five years ended October 31, 1890, the aggregate of their circulation based upon deposit of United States bonds has been reduced from \$276,304,189 to \$124,958,736, showing a net decrease during the five years of \$151,345,453. The net average decrease for each of the past five years is \$30,269,000.

This is more significant when we take into account the fact that during this period there has been an average yearly increase of 168 in the number of national banks and an increase of 839 in the aggregate.

It is evident, therefore, that causes are in operation which, unless removed, will in the near future reduce the circulation of national banks to the minimum requirements of the law.

On the 18th day of July, 1890, there were 3,484 national banks in operation having an outstanding circulation of \$126,323,880, secured by \$144,624,750 of United States bonds held in trust by the Treasurer of the United States. Of this bond deposit \$44,241,452, representing circulation to the amount of \$39,817,307, was in excess of the minimum required, and hence subject to withdrawal at the pleasure of the banks. It is to be presumed that the managers of these associations are fully advised as to their interests, and that so fast as the advancing premium on bonds renders the issue of circulating notes possible only at a loss they will surrender their circulation and withdraw their bonds. This makes probable a steady withdrawal of bonds to the amount of \$44,241,452, and the permanent retirement of \$39,817,307 of circulating notes, unless some change in existing law affords relief.

It is difficult to understand how the present withdrawal of national-bank notes can benefit any citizen of the United States. They are secured by a deposit of United States bonds, which are now owned by the banks, and pledged for the redemption of their notes. If the banks should withdraw these bonds they would still be held by some one who would receive the interest thereon, and no change of ownership would in any way relieve the Government from the payment of either principal or interest. On the other hand it would appear from every point of view that an increase to par of circulation would result in benefit to every interest in any way affected.

Upon the basis of the bond deposit of July 18, 1890, the increase of note issues to par of bonds would enable the banks to immediately augment their circulation by the sum of \$14,462,475, without the purchase by them of another bond. This would increase the revenues of the General Government, under existing laws, \$144,624.75 per annum, that being the amount of the tax or duty upon the additional issue of notes, and no increased expenditure on its part would be caused thereby.

It would benefit the people by immediately increasing the amount of money in general circulation to the extent of \$14,462,475. This increase, equal to three months' purchase of silver bullion, would have been very

effective in relieving the present monetary stringency if the bill under discussion had become a law during the first session of the present Congress.

It would have greatly facilitated the movement of crops for the current year and afforded relief to the general business of the country. Such an issue of bank notes would have been more marked and effective than the disbursement of a like sum of Treasury notes under the silver bullion act, for the reason that the bank notes would have been issued at once, at a time when greatly needed, and promptly distributed to about 3,500 banks located at various market towns and trade centers in every State and Territory, while the Treasury notes used in payment for silver bullion are issued in monthly installments and go chiefly to large dealers in the city of New York, thus delaying their general distribution.

We can now consider the effect of that provision in the bill reducing to \$1,000 the minimum of bond deposit made to secure circulation by each association. As has been stated, the bonds held as security for circulation by all associations on July 18, 1890, aggregated \$144,624,750. Under the operations of existing law these holdings may be reduced to \$100,383,298, making a possible withdrawal of \$44,241,452.

It is pertinent to inquire as to the probable withdrawal of bonds under the operations of this bill if it should become a law, and the consequent decrease in circulating notes. It is ascertained that on July 18, 1890, there were 928 associations holding bonds in excess of the minimum requirement. Of the \$70,183,750 in bonds deposited by these 928 associations, \$44,241,452 was in excess of the minimum. If these 928 associations find it for their interests to now maintain a deposit of bonds in excess of legal requirements, while they are entitled to only 90 per cent. of circulation, it seems certain that they will not withdraw bonds now pledged after the issue of circulation shall be increased to 100 per cent. of bonds. Therefore we are safe in estimating that the \$70,183,750 of note-issues to which these 928 banks would be entitled under the Sherman bill upon bonds now on deposit would not be diminished but might be increased.

In regard to the 2,556 associations which now maintain a no larger bond deposit than is obligatory under existing laws, it may be said that their operations under the provisions of the Sherman bill can not be so definitely predicted. If we proceed upon the hypothesis that each would reduce the amount of its pledged bonds to the one thousand-dollar minimum, we ascertain that their circulation would stand at \$2,556,000. If then the 928 associations in the first class should maintain a circulation of \$70,183,750 and the 2,556 associations in the second class should reduce their issues to the lowest possible point, to wit, \$2,556,000, the total circulation of all the associations would be \$72,739,750, which is \$53,584,130 less than the amount outstanding July 18, 1890. This sum may be considered as the maximum of contraction probable under present conditions in case the Sherman bill should become a law.

It must be remembered, however, that only \$3,000,000 of bonds can be withdrawn each month, so that the monthly contraction would in any event be limited to the latter amount and the retirement of the sum indicated would necessarily be distributed over a period of about two years. The possible contraction under existing law was \$39,817,307 at the date under consideration, while the maximum probable reduction under the Sherman bill is \$53,584,130. When we come to consider that under the proposed law the issue of circulation would be more profitable and the

organization of new banks greatly increased, it seems probable that the retirement would not be permanently accelerated or increased thereby, while it is certain that the first effect would be to cause an expansion of nearly \$15,000,000.

Again, it is clear that the Secretary of the Treasury will, for most of the time during the next seventeen years, be a purchaser of United States bonds, for account of the sinking fund at least, and that therefore it is for the interest of the people whom he represents that the premium on these bonds should rule low. To this end it is important that the new associations, which are now being organized with greater rapidity than at any time for the past twenty-five years, should not be forced to appear in the bond market as unwilling purchasers in competition with the Secretary of the Treasury.

During the year ended October 31, 1890, there have been organized 307 new associations, and they have been obliged by law to purchase in the open market interest-bearing bonds of the United States of the par value of \$6,680,750 for deposit to secure notes for circulation, thus increasing the demand for these securities and adding in some degree to the premium paid by the Secretary of the Treasury upon all his purchases for the same period. If the Sherman bill had been in operation these purchases would have been only \$307,000 or \$6,373,750, less than the amount above stated. Hence it seems certain that the proposed legislation would in this respect result in a saving to the people. So, from every point of view, the passage of the Sherman bill seems calculated to promote the welfare of both the banks and the people.

The Comptroller has deemed it proper to discuss this measure at considerable length, for the reason that no other legislation seems probable during the second session of the present Congress and he deems it to be of very great importance that so much, at least, should be done for the relief of the associations under his official supervision.

He has not, however, in any degree modified his views as to the necessity for a reduction of the rate of duty imposed upon national-bank currency. The imposition of such a tax can not be successfully defended upon any ground. The necessities of the Government can not be pleaded as an excuse, nor is it true that any ordinary deficit in revenues would justify the General Government in making the issue of circulation obligatory upon the banks, and then in taxing them for the involuntary exercise of a franchise which is without value.

It must be borne in mind that this duty was imposed at a time when the Government was engaged in a war of gigantic proportions and that a very considerable profit on circulation was then realized by national banks. These conditions are now radically changed; profound peace has prevailed for twenty-five years and the debt of the Nation has long since ceased to be a burden. All other internal war taxes have been abolished, except those imposed upon spirits and tobacco, and these are retained only because they are generally regarded as penalties properly imposed upon the manufacture or sale of articles the use of which is deemed incompatible with the public good. To relieve the banks of this tax would indirectly benefit the public who deal with them, as it would reduce those expenditures which are necessarily taken into consideration in fixing rates of discount and exchange.

It is proper also to call attention to the fact that the banks are otherwise called upon to pay for the expenses attending the redemption of their notes by the Treasurer of the United States, for the engraving of the plates from which their notes are printed, and for the compensation of the entire corps of examiners, the assessments made upon the banks

during the last fiscal year for the above purposes having aggregated \$269,516.10.

The above is in addition to the duty on circulation, which during the last fiscal year amounted to \$1,254,839.65. The entire sum received in taxes from these associations since the inauguration of the system is \$138,918,975.22.

The rate of duty above recommended, one-fourth of 1 per cent. per annum, would produce a sum more than sufficient to reimburse the Government for all expenditures on account of the banks, the entire salary-list of clerks included.

DEPOSITS.

The deposits of a national bank are now its principal source of profit. Originally they realized a profit upon circulation as well as deposits. The high rate of premium commanded in the market by the interest-bearing bonds of the United States, which are required to be deposited by these banks as security for their circulation, has rendered the issue of circulating notes, in most localities, unprofitable.

Hence national banks now organizing issue only so much of circulation as is obligatory under the law. They are fully cognizant of the fact that no profit will be realized on account of the right to issue notes, and proceed in their organization mainly because of the gain to result by reason of deposits.

The deposits of a bank usually bear a close relation to the degree of confidence reposed in it by those who live within the sphere of its business activities. The unprecedented success which has, as a whole, attended the operations of banks in the national system during its twenty-eight years' trial, has inspired a degree of confidence not attained by any of its predecessors. In the early years of the system depositors were in some degree doubtful as to its success, and deposits were correspondingly meager.

It is curious to note how steadily the relative proportion of deposits to capital has increased from year to year, and how close a relation the increased gain by reason of augmented deposits bears to the diminished profits by reason of note-issues. This is illustrated by noting the relative increase of capital and deposits during the period extending from January 1, 1866, to October 2, 1890. At the former date the aggregate capital of all national banks amounted to \$403,357,346, and their individual deposits were \$520,212,174. At the latter date the aggregate capital had increased to \$650,417,235, and the individual deposits to \$1,564,845,275. During this period of about twenty-five years the capital stock account shows an increase of \$247,089,889, equal to 61 per cent., while the individual deposits exhibit an increase of \$1,044,633,101, or over 200 per cent.

This comparison indicates that the rate of increase of deposits has been relatively nearly four times that of capital. While this growth is, in a certain degree, attributable to the general increase of the capital and business of the country, it is to a greater extent owing to the age of the system and the unexampled success which has attended its operations and the increased confidence thereby inspired. Whatever may be the opinion entertained with regard to the expediency of granting to banks the right to issue notes for circulation, it will be universally conceded that the public welfare is promoted by the augmentation of bank deposits. In this respect we find the interests of the banks and of the whole people identical. It is of great importance that

the circulating medium of the country be kept within the channels of trade. Whenever the surplus earnings of the wage-workers, the professional men, the farmers, the manufacturers, and the tradesmen are permitted to remain idle in the custody of individuals, legitimate borrowers are caused to pay increased rates of interest, and business and commerce languish for want of adequate banking facilities.

It is true, beyond controversy, that the national system is admirably adapted to the most thorough and complete utilization of the present supply of money, and all good citizens, and especially those who are honestly of the opinion that this supply is inadequate to the demands of business should oppose any and all efforts to embarrass or destroy an admirable system in successful operation when no opponent is able to suggest any agency adapted to an equally efficient service.

INTEREST ON DEPOSITS.

There is no provision of law prohibiting the payment of interest on deposits by national banks.

It is not proposed at this time to discuss the expediency of such a course when it is confined to the regular customers of the association who reside near it, or conduct business within, the legitimate sphere of its operations. Recent developments, however, have called the attention of the Comptroller to the embarrassments which sometimes result from the payment of interest to non-resident depositors, who are not so directly interested in the success of the association. Non-resident stockholders may be desirable in communities possessing an inadequate supply of local banking capital, but non-resident depositors who are only attracted by the payment of liberal rates of interest are a source of possible if not probable danger.

The regular customers of a bank living in the vicinity of its location, dependent upon it for accommodations, and personally acquainted with its managers, are not likely to lose confidence in its solvency, if it is conducted with ordinary prudence. As a rule, they are so situated as to suffer by its embarrassment or failure, and hence are disposed to avoid any course that might shake its credit or prevent its extending usual accommodations to its patrons. They are daily brought in contact with its local shareholders, who usually are persons of standing and influence, constituting a strong and effective corps of defenders whenever its credit is assailed by unfounded rumors. The local deposits of a bank are subject to periodical changes, which are well understood by intelligent bank managers, and being anticipated, are provided for without serious difficulty. Unusual fluctuations may cause more inconvenience, but can always be met by resort to means which every prudent banker will hold in reserve for such emergencies.

The case is different, however, when deposits have been abnormally increased by paying high rates of interest to non-residents. Upon sums thus secured there will evidently be a loss unless they are kept continually employed at full rates. Gradually this class of deposits comes to be regarded in the light of capital, upon which interest is paid in lieu of dividends, and if the latter exceed in rate the former the managers of the bank unwisely regard this manner of increasing the loanable funds of the bank as more profitable than an augmentation of its capital. For a time the conditions may be favorable, and increased dividends to shareholders result, but in due time the insecurity of the situation will become disagreeably apparent.

A case in point is where a series of crop failures has made collections in

a large degree impracticable, resulting in numerous failures and a rapid decline in values. The newspapers disseminate exaggerated reports, and the more distant the point of observation the more hopeless seems the situation. Confidence is destroyed and the non-resident depositors, infected with the timidity which afflicts capitalists, insist upon repayment, and serious embarrassment, if not failure, results. The causes which precipitate the withdrawal of deposits are identical with those rendering it impossible for the association interested to realize upon its loans and discounts, and the unduly-extended institution finds itself ground to dust "between the upper and the nether millstone." Then there is an awakening to the fact that an increase of capital would have been infinitely preferable to interest-bearing deposits of non-residents.

The stockholder is a proprietor and can not withdraw his investment when danger is apprehended, nor can he receive dividends when the net earnings of the bank are insufficient for the purpose, but no adverse circumstances can prevent the depositor from demanding the return of his funds with the interest thereon, in accordance with the terms of the contract. Other illustrations, drawn from experience, might be given to further enforce the proposition that no bank should habitually strive to re-enforce its insufficient capital or unduly increase its earnings by seeking to secure the deposits of non-residents by the payment of interest.

BORROWED MONEY.

It has been shown that deposits are an important factor in successful banking. There is a marked distinction, however, between deposits and money borrowed. It is evident from a careful reading of the national-bank act that its framers clearly recognized this distinction. Hence they established a limit beyond which an association should not extend its liabilities for money borrowed. Section 5202 United States Revised Statutes reads as follows:

No association shall at any time be indebted or in any way liable to an amount exceeding the amount of its capital stock at such time actually paid in and remaining undiminished by losses or otherwise, except on account of demands of the nature following:

- (1) Notes of circulation.
- (2) Moneys deposited with or collected by the association.
- (3) Bills of exchange or drafts drawn against money actually on deposit to the credit of the association or due thereto.
- (4) Liabilities to the stockholders of the association for dividends and reserve profits.

In the blank forms upon which the Comptroller requires banks to make their reports of condition appear the subheads "notes rediscounted" and "bills payable." These two items are supposed to include the liabilities subject to the limitation of the section quoted. It is found, however, that many bank officers charged with making these reports do not fully understand what transactions are to be classified under these two heads, and amounts which should appear there are frequently included in individual deposits or amounts due to banks. In regard to the general subject it may be said that a bank is organized for the purpose of lending money and not for the purpose of borrowing. It would therefore appear that no cashier or other officer of a bank should assume the power of borrowing money or rediscounting its paper without having been specially authorized so to do by the directors acting as a board, of which action duly authenticated minutes should be preserved in its records. Neither should the board, as a matter of prudence, exercise

this power habitually, nor at any time, unless some exigency has arisen which makes it imperative. A frequent recourse to this expedient is a sure indication that the bank has accepted accounts to the proper conduct of which its capital is inadequate, or that it is inclined to unsafely extend its business.

Very frequently undue anxiety to divide large earnings induces managers to adopt this course, and in a few cases it results from excessive accommodations having been extended to the individual directors or enterprises in which they are interested as proprietors or stockholders. Having been duly authorized by the board of directors, the cashier of a bank may lawfully rediscount its notes or bills, or borrow money for its use upon such terms and in such manner as may be for its interest, and in the latter case may issue therefor such evidence of indebtedness as may be acceptable to the lender, provided it correctly sets forth the transaction. It has, however, become the custom on the part of some banks to treat the sums thus acquired as deposits, and to issue therefor certificates of deposit, sometimes payable on demand and in other cases payable upon short notice or at some fixed date. When this course is pursued the published reports of the bank do not disclose the fact that it is a borrower and the true condition of the association is not shown. Indeed, an increase in deposits will be apparent to those who peruse its statements, when in fact a withdrawal of deposits has been the cause which induced it to become a borrower.

The characteristic feature of the national system is the publicity given to the condition of the several associations of which it is composed, and a want of accuracy defeats the end in view. Instances have been brought to the attention of the Comptroller which lead him to the conclusion that some bank officers have resorted to the expedient of publishing borrowed money as deposits for the purpose of exhibiting to the public a growth in business which would place competing institutions who were more scrupulous at a disadvantage. Cases of this kind are exceedingly rare, however, and the motive which prompts such conduct is inconsistent with that high sense of honor and that unimpeachable integrity which so conspicuously characterizes bank managers as a class. It is not an easy matter for the Comptroller nor for a bank examiner to decide, in a certain class of cases, whether a particular liability should be classed as a deposit or as a bill payable. Those charged with the conduct of the banks concerned, however, ought to be able to do so with reasonable certainty.

Ordinarily all funds intrusted to the custody of a bank upon which no interest is paid may, for the purposes of this discussion, be classed as deposits. This is also generally true of funds belonging to its local customers, upon which interest is paid by the bank, provided that the rate is so low as to leave a fair profit when a safe proportion is invested by the bank at current rates. But in all cases where the creditor demands security and receives a rate of interest approximating or exceeding that paid by legitimate borrowers in high credit it is evident that all the conditions exist which characterize a loan of money, and funds thus secured can not properly be classified as deposits. The items reported as deposits, which most frequently invite the criticism of this office, arise out of transactions like these:

(1) A bank doing business in a locality where rates of interest rule high negotiates with persons living at distant points, where loanable funds are more abundant, and secures certain sums for a fixed period and at a rate of interest current for loans at the place where the lender resides, issuing a certificate of deposit therefor.

(2) A bank similarly situated issues its certificates of deposit payable at a future date, drawing interest, and in some cases accompanied by collaterals, and places these certificates with a broker or agent for sale.

(3) An association in need of funds secures advances from a correspondent bank upon open account, or upon issue of a certificate of deposit, paying interest on the same, and in many cases pledging its bills discounted as security.

These questionable transactions take other forms, but those described are the most common.

It is evident that in the cases mentioned all the characteristics of a loan of money obtain except the form of the instrument which evidences the indebtedness. The creditor in each case is a non-resident, who expects no ordinary banking accommodations from the debtor association, and is only induced to make the transaction by the receipt of interest.

To enter such items under the head of deposits is to defeat the administration of the law, for it is evident that an enforcement of the provisions of section 5202, United States Revised Statutes, will be impracticable if a proper discrimination is not made between deposits and money borrowed.

DOMESTIC EXCHANGES.

In his annual report for 1889 the Comptroller took occasion to refer to the valuable services rendered to the people of this country by the associations composing the national banking system in facilitating exchanges and collections and reducing the rate of charges therefor. An investigation then made developed the fact that no data in reference to this very important subject were accessible, and that, in fact, no attempt had ever been made to procure statistics bearing upon this point. Further reflection led him to believe that an attempt should be made to procure the desired information through the agency of the national banking system.

In no country are banks more generally employed by all classes of people than in the United States. Almost every person engaged in any form of business activity makes use of these institutions in a greater or less degree. Each bank becomes the clearing-house for its patrons and its operations faithfully reflect the character and magnitude of the business conducted by those whom it serves. Hence if it were possible to analyze and classify the transactions of all the banks and bankers of the United States a vast amount of valuable information would become accessible to the statistician and available to the legislator.

It is, of course, impossible to procure information as to the transactions of private persons or firms engaged in the business of banking, nor is it found practicable to reach, for this purpose, the banks organized under the laws of the several States, in many of which these corporations are not subject to such supervision or control as would be necessary for the purpose. We have at hand, however, the national banking system, composed of 3,567 associations, located at trade centers in every State and Territory. Through these widely distributed agencies the larger part of the banking business of the country is transacted. No other country has so extensive a single system under the supervision of a central bureau and available for statistical purposes. It is believed, therefore, that the movements exhibited by detailed reports from these associations will prove of great value in ascertaining the needs of the country and will make possible a just estimate of the

utility of the national banking system in facilitating the exchanges indispensable in all commercial and industrial operations.

In June last the Comptroller came to the conclusion that the value of the information desired would warrant him in addressing to each national banking association a circular letter requesting a statement of the amount of drafts drawn during the year ended June 30, 1890:

(1) Upon national and other banks in the cities of New York, Chicago, and St. Louis, separately stated;

(2) Upon banks located in other reserve cities; and

(3) Upon all other banks.

The first subdivision called for a separate statement of amounts drawn upon banks located in the cities of New York, Chicago, and St. Louis. These were selected for the reason that they only were central reserve cities. Amounts drawn upon the other reserve cities were to be stated in the aggregate only. A statement of the amounts drawn upon each was desired but was not called for on account of a disposition to avoid imposing any unnecessary labor upon the clerical force of the several associations. The banks were also requested to report the estimated average rate per cent. of premium received and paid.

On the 30th day of June last 3,438 national banks were in operation, and to the cashier of each the circular letter above outlined was addressed, and of these 3,329 have furnished the information desired.

The total amount of drafts drawn by these associations during the year ended June 30, 1890, was \$11,550,898,255. We find that of this amount there was drawn on New York \$7,284,982,634; on Chicago, \$1,084,574,558; on St. Louis, \$188,765,842; on other reserve cities, \$2,527,757,482, and on all other banks and bankers, \$464,817,739. From this statement it appears that of the total sum 63.07 per centum was drawn on banks in New York, 9.39 per centum on Chicago, 1.64 per centum on St. Louis, 21.88 per centum on other reserve cities, and 4.02 per centum on banks located elsewhere.

SUBSTITUTES FOR MONEY.

In 1831 Hon. John Jay Knox, then Comptroller of the Currency, called upon all national banks to report their entire receipts and payments for two days designated, so classified as to separately show the amount of gold coin, silver coin, paper money, and checks and drafts, including clearing-house certificates. The reports received in response to the call then made were compiled and tabulated, and published in his annual report for that year.

In 1871, at the request of the late President Garfield, the then Comptroller asked for a statement of the receipts of fifty-two national banks, and in his speech on resumption, delivered in the House of Representatives on November 16, 1877, he indicates the location of the banks selected, and states the facts elicited in the following language:

In 1871, when I was chairman of the Committee on Banking and Currency, I asked the Comptroller of the Currency to issue an order, naming fifty-two banks which were to make an analysis of their receipts. I selected three groups. The first was the city banks. The second consisted of banks in cities of the size of Toledo and Dayton, in the State of Ohio. In the third group, if I may coin a word, I selected the "country" banks, the smallest that could be found, at points away from railroads and telegraphs. The order was that those banks should analyze all their receipts for six consecutive days, putting into one list all that can be called cash, either coin, greenbacks, bank-notes, or coupons, and into the other list all drafts, checks,

or commercial bills. What was the result? During those six days \$157,463,000 were received over the counters of the fifty-two banks; and of that amount \$12,370,000 (12 per cent. only) in cash, and 88 per cent., that vast amount representing every grade of business, was in checks, drafts, and commercial bills.

With this exception, no attempt had ever been made prior to 1881 to ascertain the extent of the use made of substitutes for money in banking operations in the United States. A proper solution of this question will greatly aid in any attempt which may be made to ascertain the amount of circulating medium necessary to the proper conduct of the business of the country. The gradual retirement of national-bank notes has attracted public attention to this matter, and great prominence has been given to it in recent discussions in Congress and elsewhere.

Being profoundly impressed with the importance of the great interests involved, and desiring to assist so far as possible in the ascertainment of all facts necessary to a perfect understanding of the situation, the Comptroller deemed it best to again ask the associations under his supervision to carefully note and report their receipts for two days named. As a comparison with the results obtained in 1881 was important, it was thought best to select corresponding days in 1890. In the former year, June 30 and September 17 were designated; in 1890 July 1 and September 17. In the call for 1890, July 1 was substituted for June 30, for the reason that the latter date this year fell on Monday, which day of the week it was thought would not exhibit an average day's business.

The necessary communications were prepared on the 16th day of June last and mailed to 3,438 national banking associations, that being the number authorized to do business at that date. A blank form was furnished upon which the entire receipts for the day designated were to be entered and properly classified.

Reports were received from 3,364 national banks out of the 3,438 addressed, exhibiting their receipts for July 1, 1890.

Similar statements have come to hand from 3,474 associations out of 3,484 addressed, giving the same information as to the transactions of September 17, 1890.

On both these days, a few banks neglected to take the necessary precautions, and in these cases other near dates, which would represent an average day's business, were substituted. Several of the banks not reporting were recently organized and had not opened for business on the dates for which statements were required.

The total receipts of the 3,364 banks on July 1 last were \$421,824,726. Of this sum \$3,726,605 was in gold coin, \$1,352,647 in silver coin, \$6,427,973 in gold Treasury certificates, \$6,442,638 in silver Treasury certificates, \$7,881,786 in legal-tender Treasury notes, \$5,241,967 in national-bank notes, \$520,000 in United States certificates of deposit for legal-tender notes, \$189,408,708 in checks, drafts, certificates of deposit, and bills of exchange, \$4,391,177 in clearing-house certificates, \$194,290,203 in exchanges for clearing-houses, and \$2,138,022 in miscellaneous items not classified.

Of the total receipts on that day .89 per cent. was in gold coin, .32 per cent. in silver coin, 1.52 per cent. in gold certificates, 1.53 per cent. in silver certificates, 1.87 per cent. in legal-tender notes, 1.25 per cent. in national-bank notes, .12 per cent. in United States certificates of deposit for legal-tender notes, 44.90 per cent. in checks, drafts, and bills of exchange, 1.04 per cent. in clearing-house certificates, and 46.56 per cent. in exchanges for clearing-houses, including miscellaneous items.

It will thus appear that of the total receipts, 7.50 per cent. was in coin and paper money, and the remainder, 92.50 per cent., consisted of checks, drafts, bills of exchange, etc., in which is included exchanges for the clearing-houses, clearing-house certificates, and miscellaneous items.

The total receipts for the 3,474 national banks on September 17 last is stated at \$327,378,251. Of this amount \$3,702,772 was in gold coin, \$1,399,991 in silver coin, \$6,159,305 in gold Treasury certificates, \$5,908,714 in silver Treasury certificates, \$7,665,666 in legal-tender Treasury notes, \$4,371,778 in national-bank notes, \$105,000 in United States certificates of deposit for legal-tender notes, \$168,803,756 in checks, drafts, and bills of exchange, \$2,428,834 in clearing-house certificates, \$126,596,873 in exchanges for clearing-houses, and \$135,562 in items not classified. The relative proportions of the several items are stated thus:

Gold coin, 1.13 per cent., silver coin, .43 per cent., gold certificates, 1.88 per cent., silver certificates, 1.81 per cent., legal-tender notes, 2.34 per cent., national-bank notes, 1.34 per cent., United States certificates for legal-tender notes, .03 per cent., checks, drafts, and bills of exchange, 51.58 per cent., clearing-house certificates, .74 per cent., and exchanges for clearing-houses, including items not classified, 38.72 per cent.

By consolidating the several items into two classes, we find that 8.96 per cent. was in cash and 91.04 per cent. in checks, drafts, and other substitutes for money.

The first table introduced exhibits the total receipts of all reporting banks for July 1 and September 17, 1890, so classified as to show the separate amounts received in gold coin, silver coin, the various kinds of paper money, and all substitutes for money, and also the percentage which each of these items bears to the total receipts.

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CIRCULATING NOTES.

The actual circulation outstanding on October 2, 1890, for which the banks were responsible, was \$125,176,956, this amount being exclusive of \$56,403,554 also in circulation, but represented by lawful money deposited by the banks for redemption purposes whenever the notes are received by the Treasurer.

The minimum deposit of the bonds required of the 3,540 national banks in operation October 2, 1890, was \$101,247,615, upon which only \$91,122,854 of national-bank circulation could be issued. These banks held, on October 2, \$130,969,050 of bonds and were responsible for \$34,054,102 of circulation more than the minimum.

Of the 3,540 banks, 2,559 have a capital not exceeding \$150,000, nor less than \$50,000 each, which is the lowest amount any bank in the system may have, the aggregate capital amounting to \$208,790,960. The remaining 981 have a capital of over \$150,000 each, the aggregate amounting to \$441,656,275. If an amount of bonds equal to the total capital were deposited to secure circulation, the whole body of banks might have a circulation amounting to \$585,402,512, or \$494,279,658 more than the present minimum. A table in the Appendix, page 135, shows by States and geographical divisions this information in detail.

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STATEMENT SHOWING THE AMOUNT OF GOLD, SILVER, ETC., HELD BY NATIONAL BANKS ON JULY 18, 1890, AND BY OTHER BANKING INSTITUTIONS ON OR ABOUT THE SAME DATE.

Classification.	National Banks.	Other (4,515) banking institutions.	Total.
Gold coin	\$73,989,092	\$25,821,910	\$99,811,001
Gold Treasury certificates	72,958,100		72,958,100
Gold (clearing-house) certificates	4,463,000		4,463,000
Silver dollars	6,709,752		6,709,752
Silver, fractional	4,824,802	1,010,822	5,835,624
Silver, Treasury certificates	16,865,318		16,865,318
National bank notes	21,184,428	39,683,670	60,868,098
Legal-tender notes	92,480,460		92,480,460
Fractional currency	790,010		790,010
Specie, not classified		15,573,102	15,573,102
Cash, not classified		102,253,674	102,253,674
Total	293,062,007	165,354,087	458,416,094

* And coin certificates.

The Comptroller desires to make grateful acknowledgment of the conspicuous fidelity, faithfulness, and efficiency which has characterized the services of those with whom he has been associated in conducting the affairs of this Bureau. The unremitting labor incident to the preparation of the statistical information herewith submitted, although unusually severe, has been most cheerfully performed at much personal sacrifice.

EDWARD S. LACEY,
Comptroller of the Currency.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

REPORT OF THE CHIEF OF THE BUREAU OF ENGRAVING AND PRINTING.

TREASURY DEPARTMENT,
BUREAU OF ENGRAVING AND PRINTING,
October 23, 1890.

SIR: I have the honor to submit the following report of the operations of this Bureau during the fiscal year 1890:

On taking charge of the Bureau, July 1, 1889, among the first matters requiring attention was the settlement of the question of the further use of steam-presses in the work of plate-printing. The Government owned eighteen such presses and had in use an additional press belonging to private parties. All of these presses had been stopped at the close of work the last day of the fiscal year 1889, pending the settlement of this question. Congress, by act of March 3, 1889, had provided that no additional steam-presses should be procured; that no part of the appropriations made for the operations of the Bureau should be used in their repair, and that a sum not greater than one cent per thousand sheets should be paid as a royalty for their use. After careful consideration of the subject it was decided, on account of the restrictions imposed upon their use by Congress, to permanently discontinue the use of the steam-presses. In view, however, of the time required to make and set in position for working the number of hand-presses necessary to supply

the work formerly executed on the steam-presses, it was deemed best to continue the use of the steam-presses until the new hand-presses could be made available. To do this it was necessary to obtain acceptance by the owners of the patents on the presses of the rate of royalty provided by the act of Congress, and a contract was accordingly prepared and submitted to them, authorizing the United States to use the presses on the payment of a royalty of one cent per thousand impressions. The owners declined to execute this contract, and the presses were accordingly removed from the Bureau, and sixty-seven hand presses were as rapidly as possible made and placed in position for work. To enable the Bureau to meet the demands upon it while the hand-presses were being introduced, and subsequently to make good the loss of time by reason of sickness, the force of plate-printers and other employes connected with the work of plate-printing were required to work from July 1 to November 18, 1889, one hour overtime daily, and from November 19 to the close of the fiscal year one hour and a half daily. The Bureau was thus enabled to meet all the demands upon it without serious embarrassment to the operations of the Government, every sheet of work actually needed in the public business being furnished.

The expenditures during the year were:

For salaries of officers and employes other than plate-printers and assistants.....	\$396,959.50
For plate-printing.....	451,978.40
For materials and miscellaneous expenses.....	\$173,851.28
Less amount of repayments for material purchased from the Bureau.....	2,518.90
	<hr/> 171,332.38
Total.....	1,010,270.28

The appropriations for the year were \$1,017,450, and there was an unexpended balance of \$7,179.72. Owing to the necessity for working overtime during the year, a deficiency appropriation for compensation of employes other than plate-printers and assistants of \$7,000 was asked for, and was made by act of June 17, 1890. It will be noticed that the unexpended balance is slightly in excess of this amount, and had the aggregate of the appropriations been made in one item instead of being divided under three heads, as the expenditures were within the amount originally appropriated, it would not have been necessary to obtain the deficiency appropriation.

There were completed and delivered during the year 8,702,320 sheets of United States notes, gold and silver certificates, bonds, and national-bank notes, with a face value of \$227,583,050; 26,610,088 sheets of internal-revenue and customs stamps, containing 737,002,012 stamps; 1,200,311 sheets of drafts, checks, certificates, etc., besides a large amount of miscellaneous work for the various departments of the Government. The amount of work delivered would have been larger but for the great amount of sickness among the employes during the winter of 1889-90, caused by the epidemic *la grippe* then prevailing.

There was added to the plant of the Bureau during the year new machinery to the value of \$11,252.33, and the building was improved by a new metal roof costing \$3,900, making a total expenditure for these two purposes of \$15,152.38.

The amount of work to be executed during the fiscal year 1891 is nearly 15 per cent. greater than the amount delivered during the year 1890, and nearly 8 per cent. greater than the amount executed in the year 1889, in which were made the largest deliveries during a period of thir-

teen years. It has taken time to make the necessary arrangements and to train the additional operatives required to execute this increased amount of work. This has now been done so far as the amount of space at my disposal will permit, and I expect, therefore, to be able to meet all the demands upon the Bureau promptly. To do this it may be necessary to work a portion of the force overtime until the new wing of the building provided for during the last session of Congress is completed and fitted up for the occupancy of the branches that will be transferred thereto.

There is still needed to make the facilities for the execution of the Bureau's work complete an out-building for the accommodation of the ink-mills, laundry, carpenter shop, stable, and for storage. All of these, with the exception of the ink-mills, are now accommodated in temporary frame structures that are a menace, not only to the Bureau building proper, but to the entire neighborhood, on account of their combustible character. The necessity for this building has heretofore been called to the attention of Congress, and it is hoped that at the next session an appropriation will be made to provide for its erection.

I can not conclude this report without making acknowledgment of valuable support and assistance rendered me in this my first year by the assistant chief, the accountant, and the superintendents in charge of the various divisions. Excellent discipline has been maintained in every department, and order and good business system prevails throughout the entire establishment.

I wish also to gratefully acknowledge the courtesy with which I have been uniformly treated by yourself, the Assistant Secretaries, and the gentlemen connected with your respective offices.

With the utmost respect, your obedient servant,

WM. M. MEREDITH,
Chief of Bureau.

Hon. WILLIAM WINDOM,
Secretary of the Treasury.

REPORT ON IMMIGRATION, BY THE CHIEF OF THE MISCELLANEOUS DIVISION, SECRETARY'S OFFICE.

TREASURY DEPARTMENT,
SECRETARY'S OFFICE,

November 1, 1890.

SIR: I have the honor to submit the following report on immigration matters, as administered during the fiscal year ending June 30, 1890, under the act of August 3, 1882, "to regulate immigration," together with a brief reference to the enforcement of the alien contract labor laws.

The second section of the act to regulate immigration, approved August 3, 1882 (22 Stat., 214), charged the Secretary of the Treasury with the duty of executing the provisions of the act, and with supervision over the business of immigration to the United States, and for that purpose it enacted "that he shall have power to enter into contracts with such State commission, board, or officers as may be designated for that purpose by the governor of any State to take charge of the local affairs of immigration in the ports within said States."

The first contract made by the Secretary pursuant to this authority was concluded with the Commissioners of Emigration of the State of

New York September 2, 1882. After an experience of over seven years under this contract it became obvious that the immense business of immigration at the port of New York could not be efficiently and successfully conducted by the Secretary through a board of nine persons constituted by State authority, entertaining widely different views, and always more or less indisposed to act in subordination to the authority expressly given to the Secretary of the Treasury.

In view of the lack of harmony, and the wide differences of opinion on important points, which had been developed, it was believed that joint control of immigration matters in the city of New York by State and Federal authorities was incompatible with the best service, and it was decided to make a change, provided the authority to do so was clear under the law. As it had been maintained by some that the law authorizing the Secretary to contract with State officers was mandatory and not simply advisory, the question was submitted to the Attorney-General for his opinion and advice. On the 8th of February, 1890, the Attorney General, in an elaborate document, expressed the opinion that the law referred to is not mandatory in its terms, and "that the Secretary is not restricted in the carrying out of the provisions of this act to the agencies mentioned in the second and fourth sections; that it is in his discretion whether he will use them or not."

Acting upon this opinion, and in accordance with the provisions of said contract, authorizing either party to revoke it by giving to the other party sixty days' notice in writing, due notice was given to the Commissioners of Emigration of the State of New York that the contract with them should terminate on the 18th day of April, 1890. In the mean time Hon. John B. Weber was appointed superintendent of immigration, and Mr. James R. O'Beirne assistant superintendent, at the port of New York. Efforts were made to lease Castle Garden, in order that the reception, detention, and examination of immigrants might be temporarily continued at that place. Failing in this, the Barge Office was hurriedly fitted up and made available for the transaction of the business, and since the 19th of April, 1890, it has been used for that purpose. The new officers named, together with a corps of immigrant inspectors, all co-operating with the collector of the port, succeeded in getting immediate control of the business, and it is now successfully managed with as little friction as might be expected. In addition to carrying out the main objects of the law, much is now done at the port of New York for the welfare and benefit of immigrants in protecting them from fraud and imposition by supervising the exchange of moneys, purchasing railroad tickets, communicating with their friends, and in protecting females against disreputable characters and evil associations while under the jurisdiction of the immigrant officials.

The great and apparently increasing expense of the immigration service at the port of New York was also attracting grave attention, and it was believed that the proposed change would result in a decrease in the necessary outlay. This expectation it seems will be fully realized, as a comparison recently made by the Superintendent of Immigration at that port shows that the cost of care and maintenance of immigrants under the present administration from April 19 to October 1, 1890, was \$13,497.50, while the cost for the same under the State board for the same period of time in 1889, calculated at the average cost for the year, was \$38,250.12, a reduction in five months of \$24,752.58.

Figures taken from the immigrant accounts in this division show that during the administration of the New York Board of Emigration for the period from July 1, 1889, to April 19, 1890, the immigrant fund

at the port of New York was reduced from \$100,030.03 to \$77,961.59, a net decrease of \$28,124.44; and that during the administration of the Superintendent of Immigration from April 19 to November 1, 1890, a period of six and one-third months, this fund was increased from \$77,691.59 to \$119,863.06, a net increase of \$42,901.47.

Without at least one year's administration under the Superintendent of Immigration figures for a full comparison of expenditures can not be obtained; but, as the figures so far show a radical change from a decreasing to an increasing surplus, it is fair to assume that the management of immigration matters at the port of New York by a Treasury officer will prove to be much less expensive and more satisfactory than under a contract with State commissioners.

A joint resolution authorizing the Secretary of the Navy to remove the naval magazine from Ellis Island and appropriating \$75,000 to enable the Secretary of the Treasury to improve the island for immigration purposes, was approved April 11, 1890. The sundry civil bill, approved August 30, 1890, contains an additional appropriation of \$75,000 for the same purpose. The contemplated improvements consist of 853 feet of docks, with 860 feet of additional crib work; the dredging of a channel to a depth of 12 feet or more, 200 feet in width, and 1,250 feet in length; a wooden building, 150 by 400 feet, two stories in height; also a contagious hospital, capable of accommodating thirty patients; an insane hospital, capable of accommodating forty patients; also a boiler house with pumps, tanks, laundry, steam-heating, and electric-light plants, artesian wells and cisterns, all of which work is now being prosecuted with vigor, and it is hoped that the plant will be ready for occupation by April 1 next.

At the ports of Portland, Me., Boston, Philadelphia, Baltimore, Key West, New Orleans, Galveston, and San Francisco contracts are still existing with State boards or commissioners, as heretofore reported.

Earnest efforts have been made to prevent the landing of any of the prohibited classes, by requiring careful examinations of passengers arriving on vessels at any of these ports. In the absence of any penalties, the question has arisen how the master of a vessel, the collector of a port, or the immigrant officer designated by the Secretary can enforce the detention of passengers on board the vessel after its arrival at its dock for such time as may be necessary to determine the citizenship of each passenger, and also whether any of the alien passengers are of the prohibited classes. The law provides that all persons found to be of the prohibited classes "shall not be permitted to land." But the question is, "Who is to hold them and how are they to be held on board until the examination shall have been made?"

In the absence of any specific and detailed provisions on this point, it is obvious that when a vessel arrives, crowded with passengers and immigrants all eager to land, the proper detention and examination can easily be evaded. That such cases may have often happened at New York is shown by the fact that for the period from April 19 to September 30, 1890, it was found by a comparison of the manifests furnished by the steamship companies with the registry books of the Superintendent of Immigration that the companies or officers of the vessels had failed to report and pay the head tax on 1,018 immigrants, who, so far as the officers of the vessels were concerned, might have landed without examination. A case was recently reported of an immigrant sixty-four years of age, who, within two weeks after arrival at New York, applied for aid. In his statement he said that when the steamer arrived at the pier he walked off into the city. These examples illustrate the

weakness of a law that prescribes prohibitions, but does not provide means for their enforcement, nor prescribe any penalties.

In connection with this subject I may properly refer to that clause of the "sundry civil expenses" act approved August 30, 1890, which appropriates \$75,000 "for the enforcement of the alien contract-labor laws and to prevent the immigration of convicts, lunatics, idiots, and persons liable to become a public charge from foreign contiguous territory." This was doubtless intended to apply to the state of things existing on the borders, especially the Canadian border, as mentioned in the last annual report of the Secretary of the Treasury, and still existing, where thousands of alien immigrants are landed at Halifax and ports of the Dominion, and thence come by rail and otherwise into the United States without examination and without restriction upon the prohibited classes, the vessels by which they come thus escaping the payment of the passenger head-tax. In the entire absence of penalties and specific provisions for legal process the business of *prevention* on a line of several thousand miles is not likely to be remarkably successful.

In the month of July last this Department was advised through the Department of State that the Italian Government had prepared a notice, which was directed to be printed on the back of passports issued to Italian subjects emigrating to this country, warning them of the laws prohibiting the entry of convicts, imbeciles, idiots, paupers, and contract laborers, and the Italian minister furnished a copy of the notice so prepared for the information of the Federal authorities. If other foreign governments would follow this example it would doubtless result in preventing the incoming of many persons of the prohibited classes. If means were provided to meet the expense instructions might be issued to our consuls and consular agents in countries from which immigrants mostly come to have similar notices printed in the several languages, and then have them carefully circulated among intending immigrants at the various ports of departure.

ALIEN CONTRACT-LABOR LAWS.

There has been no change by enactment, during the past year, in the "act to prohibit the importation and immigration of foreigners and aliens under contract or agreement to perform labor in the United States, its Territories, or the District of Columbia," known as the "alien contract-labor laws;" therefore very little can be added to what has heretofore been repeatedly said in regard to their defects, and the difficulty of enforcing the main provision without adequate penalties and without any defined legal process.

Another year's experience only demonstrates the fact of frequent evasions of the law by immigrants who come well tutored and prepared to escape the vigilance of our officers, and in spite of all efforts at the various ports of landing and of the immigrant inspectors designated to watch the Canadian and Mexican borders they find their way to a damaging competition with our home labor. Yet it is satisfactory to note that the presence of immigrant inspectors and inquiries and proceedings which have been instituted have directed attention to the purpose of the Government to enforce the law, and are operating to a great extent to prevent importation of alien laborers from Canada and Mexico as well as at the sea-board ports.

Improved methods recently adopted at the port of New York, where the greatest numbers of immigrants arrive, bid fair to check to some extent the landing of imported aliens there. The returns show that during the administration of the present Superintendent of Immigra-

tion, from April 19, 1890, to October 1, 1890, 123 have been detected and returned as against 40 returned during the longer period from March 1, 1889, to April 19, 1890. Statistics further show that for a period of over four years to March 1, 1889, only 47 alien contract-laborers had been detected and returned from all the ports, while since that date to October 1, 1890, a period of eighteen months, 200 have been returned. These results show increased vigilance and efficiency on the part of the immigrant officials, and still better results would be shown if the defects of the law were cured.

The following tables are respectfully submitted.

Table No. 1 shows the number of immigrants examined by immigrant officials and permitted to land, and the number prevented from landing and returned to the countries from which they came, by reason of their being either convicts, lunatics, idiots, or persons liable to become a public charge, in accordance with the provisions of the immigrant act.

Table No. 2 is a statement showing the receipts of capitation tax at all the ports, and the disbursements for expenses incurred at each port in regulating immigration, and the balances.

Table No. 3 shows the nativity of immigrants who arrived in the United States during the past fiscal year.

Table No. 4 shows the occupations of immigrants as reported by themselves on arrival at the several ports of the United States during the past year.

Table No. 5 shows the destinations, by States and Territories and the District of Columbia, of all immigrants who landed at our ports during the year.

Respectfully,

J. W. THOMSON,
Chief of Miscellaneous Division.

Hon. WILLIAM WINDOM,
Secretary of the Treasury.

APPENDIX.

TABLE NO. 1.—NUMBER OF IMMIGRANTS EXAMINED BY THE IMMIGRANT OFFICIALS AT THE SEVERAL PORTS NAMED, AND THE NUMBER RETURNED TO THE COUNTRY WHENCE THEY CAME, DURING THE FISCAL YEAR ENDING JUNE 30, 1890.

Ports.	Number examined.			Number returned.				
	Males.	Females.	Total.	Con- victs.	Luna- tics.	Idiots.	Liable to become a public charge.	Total.
Baltimore	14,269	12,610	27,179				27	27
Boston	15,960	14,207	30,173		1	1	51	53
Galveston	39	14	53					
Kan. West	1,727	852	2,579				10	10
New Orleans	3,155	1,172	4,327					
New York	212,458	116,233	328,691	3	25	2	384	414
Portland, Me.	400	181	581					
Philadelphia	12,310	6,531	18,841				40	40
San Francisco	5,060	1,327	6,387				2	2
Provincetown, Mass.	38	13	51					
Wilmington, Mass.	3	1	4					
New Bedford, Mass.	452	177	629					
Total	265,249	156,628	421,877	3	26	3	501	533

* The number of immigrants landed at New York during the nine months and eighteen days administration of the State Commissioners was 230,872. The number landed during the two months and twelve days administration of the Superintendent of Immigration was 118,819. The number of immigrants of the prohibited classes detected and returned under the State Commissioners during nine months and eighteen days administration was 246. The number detected and returned during two months and twelve days administration of the Superintendent of Immigration was 174.

TABLE NO. 3.—NATIVITY OF ALIEN IMMIGRANTS ARRIVING IN THE UNITED STATES DURING THE FISCAL YEAR ENDING JUNE 30, 1890.

	Ireland.	England.	Wales.	Scotland.	Germany.	France.	Russia.	Poland.	Switzerland.	Sweden.	Norway.	Belgium.	Holland.
New York, N. Y.	22,812	25,311	461	4,380	69,775	1,657	29,150	8,869	9,770	32,510	8,972	2,199	3,194
Boston, Mass.	11,141	7,890	23	1,969	329	56	1,691	452	7	4,112	1,344	7	11
Philadelphia, Pa.	5,242	4,497	101	959	3,667	80	981	1,691	27	1,806	977	203	27
Baltimore, Md.	156	402	2	6	18,021	11	3,214	103	29	196	64	15	12
San Francisco, Cal.	92	929	1	92	252	103	21	3	17	28	25	10	3
San Francisco, Cal.	487	1	1	7	4	1	1	1	1	1	1	1	1
New Orleans, La.	15	293	1	19	212	680	17	29	7	6	29	4	1
Portland, Me.	145	290	2	14	10	20	1	1	1	1	1	1	1
Galveston, Tex.	10	22	1	1	1	1	1	1	1	1	1	1	1
Other ports	1	1	1	1	1	1	1	1	1	1	1	1	1
Total	49,727	39,977	592	7,970	82,639	3,601	34,691	19,926	6,874	29,085	11,392	2,467	3,259

	Italy.	Spain.	Portugal.	Denmark.	Hungary.	Austria.	Romania.	Australia.	Turkey.	Greece.	China.	All other countries.	Total.
New York, N. Y.	48,939	136	732	7,727	10,969	22,380	8,306	13	514	200	1,961	328,691	
Boston, Mass.	17	8	45	256	12	59	5	5	1	1	1,118	30,173	
Philadelphia, Pa.	95	13	387	296	356	31	337	1	1	1	643	22,941	
Baltimore, Md.	2	1	491	4,580	1	1	1	1	1	1	2	27,173	
San Francisco, Cal.	69	19	110	11	29	252	1	1	1	1,776	1,419	5,297	
San Francisco, Cal.	5,061	1	2	1	1	1	1	1	1	1	1	2,579	
New Orleans, La.	2,081	134	3	5	12	1	1	1	1	1	63	300	4,327
Portland, Me.	1	1	30	1	1	1	1	1	1	1	10	581	
Galveston, Tex.	1	1	1	1	1	1	1	1	1	1	1	32	
Other ports	1	1	1	1	1	1	1	1	1	1	1	682	
Total	51,601	2,364	919	8,202	257	26,000	8,306	271	558	550	1,889	5,220	421,877

TABLE NO. 4.—STATEMENT OF THE REPORTED OCCUPATIONS OF IMMIGRANTS WHO ARRIVED IN THE UNITED STATES DURING THE FISCAL YEAR ENDING JUNE 30, 1890.

Occupation.	Number.	Occupation.	Number.
Architects	63	Machinists	1,592
Brewers	628	Millers	399
Blacksmiths	1,055	Musicians	557
Barbers	831	Painters	1,693
Bakers	1,897	Prechers	4,374
Blacksmiths	1,921	Plasterers	729
Blacksmiths	192	Porters	391
Blacksmiths	1,270	Potters	217
Carpenters	3,786	Printers	653
Carpenters	1,656	Saddlers	472
Cooks	238	Shoemakers	3,929
Cooks	1,860	Spicers	551
Cooks	483	Tailors	6,351
Cooks	471	Tinsmiths	747
Cooks	10,563	Tanners	417
Cooks	299	Wagonmakers	390
Cooks	1,956	Weavers	1,440
Cooks	397	Waiters	1,117
Cooks	706	All other occupations	24,289
Cooks	144,724	No occupation, including women and children	181,487
Cooks	230	Not reported	17,130
Cooks	31		
Cooks	4,652		
Cooks	4,206	Total	421,877

TABLE NO. 5.—TABLE SHOWING THE NUMBER OF IMMIGRANTS DESTINED TO EACH STATE, TERRITORY, AND THE DISTRICT OF COLUMBIA DURING THE FISCAL YEAR ENDING JUNE 30, 1890.

States and Territories.	Number.	States and Territories.	Number.
Alaska	13	Massachusetts	34,842
Alabama	282	New Hampshire	64
Arizona	119	North Carolina	21
Arkansas	229	Nebraska	5,475
Connecticut	6,874	Nevada	228
Colorado	9,876	New Jersey	15,885
California	11,564	New Mexico	743
Delaware	1,348	New York	125,766
District of Columbia	627	Ohio	13,255
Dakota	3,967	Oregon	1,143
Florida	2,829	Pennsylvania	71,967
Georgia	262	Rhode Island	1,978
Indiana	2,636	South Carolina	171
Indian Territory	187	Tennessee	429
Illinois	34,529	Texas	1,336
Iowa	7,958	Utah	1,625
Idaho	269	Vermont	89
Kentucky	759	Virginia	718
Kansas	2,964	West Virginia	544
Louisiana	2,699	Wisconsin	10,492
Maine	884	Washington	1,767
Maryland	3,661	Wyoming	323
Michigan	15,426	Territories	1,671
Missouri	5,405	Not reported	15
Minnesota	9,368		
Mississippi	236	Total	421,857
Montana	847		

REPORT OF THE BOARD OF EXAMINERS.

CIVIL SERVICE.

It is my belief that the personnel and efficiency of the service have been in no way lowered by the present method of appointments to clerical positions in the Department. The beneficial influences of the civil-service law in its practical workings are clearly apparent. Having been at the head of the Department both before and after its adoption, I am able to judge by comparison of the two systems, and have no hesitation in pronouncing the present condition of affairs as preferable in all respects. Under the old plan, appointments were usually made to please some one under political or other obligations to the appointee, and the question of fitness was not always the controlling one. The temptation to make removals, only to provide places for others, was always present and constantly being urged by strong influences, and this restless and feverish condition of departmental life did much to distract and disturb the even current of routine work. Under instrumentalities which are now used to secure selections for clerical places the Department has some assurance of mental capacity and also of moral worth, as the character of the candidates is ascertained before examination.

The manifold duties of the Department require the closest application on the part of the Secretary and his assistants, and the freedom from importunity now enjoyed for appointments to places that are within the classified service, and the saving of valuable time heretofore devoted to the distribution of minor patronage, are of very great advantage, and enables these officers to devote more thought to the important questions of administration constantly arising. The clerks received from the Civil Service Commission usually adapt themselves readily to the duties they are called upon to perform, and rank among the most efficient in the Department.

This Department has for the past twenty years conducted examinations under its own regulations for promotions in its service, and employes have been advanced from one grade to the next higher only after having passed a standard examination intended to demonstrate their capability as compared with those who have already reached the higher grades, and to test their familiarity with, and proficiency in, the special work upon which they have been engaged. This system of promotion has

worked satisfactorily, and reaches beyond the ascertainment of individual excellence. Clerks have the facts constantly before them that to gratify a laudable ambition for advancement they must always be prepared, as the opportunity for promotion may come at any time, to submit to tests which will disclose their aptitude, their diligence, and their knowledge of the class of work they have been performing. It keeps the service in better form and relieves the appointing power of much persistent persuasion from outside sources to elevate clerks who are illy prepared to fill the higher grades. I take pleasure in referring in this connection to a detailed statement of the examiner, which will be found in the appendix to this report. Among the few positions in the Department excepted from the operation of the civil-service law are the special agents, whose duties are very important and require abilities of a superior order. It has therefore been thought best before appointment, to subject the selected applicant to a test of his fitness for the place and this has been done during the past few months with excellent results. The advisability of pursuing the same course with chiefs of divisions is having serious consideration at this time.

The several reports of the heads of offices and bureaus are herewith transmitted.

WILLIAM WINDOM,
Secretary of the Treasury.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.



REPORT
OF THE
SECRETARY OF WAR.

WAR DEPARTMENT,
Washington, November 15, 1890.

To the PRESIDENT:

I have the honor to submit my second annual report of the condition and needs of this Department.

The legislation of the present Congress affecting the Army has been unusually important, and embraces provisions for lineal promotion and professional examinations therefor, acts for the prevention of desertion, the limitation of punishments under the Articles of War, and the improvement of courts-martial, and appropriations for additional machinery for the manufacture of large guns and for the beginning of a system of coast defense.

LINEAL PROMOTION.

By the act of October 1, 1890, promotions below the rank of a general officer are hereafter to be made lineally throughout each arm of the service. The operation of the law is postponed in the case of present first lieutenants only. Whatever advantages there might have been in the old system of regimental promotion, they were such as would prevail in a large army rather than in a small one and in war than in time of peace. On their present basis it certainly could not increase the *esprit de corps* of individual regiments. The change is one eminently just to officers and is fittingly inaugurated in connection with its companion measure in the same act.

EXAMINATIONS FOR PROMOTION.

That measure provides for a system of examinations for all officers of the Army below the rank of major, and makes their right to promotion

conditional on them. There are exceptional provisions, however, in the interests of officers who came in from the volunteer service. The measure as a whole is one of great importance to the efficiency and high professional standing of the officers of the Army. Although in keeping with the practice of all the great European powers, it is thoroughly American in theory, being based on a recognition of merit and capability. Heretofore officers have been entitled to promotion in regular rote, without any regard to competence or incompetence, efficiency or inefficiency. The new law makes no change in the rule of promotion by seniority, and the examinations are in no sense competitive, but they do require an officer to show affirmatively his fitness for the advancement to which, if qualified, the law entitles him. It is believed that its tendency must be to increase the zeal and industry of young officers.

COURTS-MARTIAL.

There have been three measures of particular importance to the administration of military justice. By the act of April 11 the time within which a person can be prosecuted for desertion has been limited to two years. The act of October 1, instituting summary courts for the trial of certain petty offenses, provides a prompt and very satisfactory method for the adjustment of such matters. It will oftentimes save the soldier from a long precedent confinement in the guard-house and relieve the investigation of his case from the cumbrous machinery of a formal court-martial. The interests of the accused are carefully guarded by the terms of the law, and the right is especially reserved to him to demand and receive a trial before a court-martial if he so desires.

In this connection I may remark that, in view of particular cases called to my attention where there seemed to have been a failure of justice in the trial of enlisted men, I caused an order to be issued on the 18th of March last directing that on the request of any prisoner a suitable officer should be detailed as counsel to defend him.

The ill-defined limits of punishment in the Articles of War have been corrected by the act of September 27, authorizing you, when punishments are left by those articles to the discretion of the court-martial, to prescribe and define limits which in time of peace they shall not exceed. As thirty-two of the thirty-four Articles of War under which enlisted men can be tried leave the punishment entirely to the discretion of the court-martial, the only check heretofore upon their variableness and the disparity of punishment prevailing in different

departments has been the executive clemency. It has been the aim of the Department, by a system of remission of sentences deemed excessive, to partially remedy that evil, a course only defensible on the ground of its imperative necessity, since it tended to impair one of the most salutary elements of all punishment, its certainty, and to pervert the proper use of the pardoning power. The act places the whole subject upon a very proper and satisfactory basis. It may be interesting to note that, although the legislation referred to was enacted too late to have had effect during the present year, still, the number of courts-martial were reduced to 1,782 the past year from 1,999 the year before, a decrease of 217 or 11 per cent. This in itself is indicative of the improving tone of the Army.

COAST DEFENSE.

It has been our traditional policy from the first to avoid entangling alliances. We are separated by an ocean from the powers which maintain great armies. The military resources of the nation have been so recently demonstrated and its net-work of railways is so adapted to a rapid concentration of troops on any threatened point, that no hostile force is likely to seek an encounter with us on our own soil. A small army sent upon our shores could not hope for success; it is not probable that any large one will incur the risk. We have, therefore, little to fear from invasion, and are free from the necessity of maintaining large standing armies or of fortifying against land attacks.

But our long coast line is peculiarly exposed to an attack from the sea. So long as an enemy can reach vulnerable points without exposing himself to our land forces he may inflict blows which we are unable to parry, and which may cause losses ill to be endured. No great civilized nation to-day has more just cause than ours to look well to the condition of its coast defenses, and none, since the civil war, has so wholly neglected them. It is a matter of congratulation that this national deficiency is beginning to excite the attention it merits, especially as time, even more than money, is necessary for its proper preparation.

A modern land battery constitutes a permanent defense upon a battlefield, chosen in advance, where no flanking is possible and where an enemy must force his way or abandon the attack. In such a contest ships of war are placed under every disadvantage. The channel is selected where their deployment is difficult, while they are at the cen-

ter of a concentrated fire from many dispersed guns. Modern inventions in the use of electricity, high explosives, and in rifled mortars, have resulted strongly in favor of the comparative resisting strength of land fortifications as against a naval force. They can not be blown up by dynamite nor sunk by vertical fire. They can support any weight of armament, and can protect themselves by any weight of earth or stone or iron. For accurate aim they have the solid earth for a foundation. They also have the co-operative aid of our own navy, of torpedoes, and submarine mines, and other accessory means of defense. When our principal cities, our harbors and our navy-yards are thus protected, then our coasts will be safe, and our navy and our increasing commerce will have safe ports of refuge, where they can be repaired, recoaled, and refitted.

The efficiency of land defenses is no experiment. It was the former wise policy of the Government, previous to the civil war, to maintain coast fortifications entirely competent to resist the vessels of war of that period. They are the cheapest to build; they are the cheapest to maintain; they are always in position, and ready for service. A modern land battery when once constructed and armed needs few repairs and no renewals. Outlays for coast defense are investments which yield large interest in the form of insurance, with little deterioration to principal. As the sole object of harbor fortifications is defense, their construction should at least keep pace with, if not precede every other preparation; for it has been well said that "while we may afford to be deficient in means of offense, we can not afford to be defenseless."

Under the fortification act of last session positions for forty-eight mortars in three groups of sixteen each, and for three of the new long-range guns will be prepared in New York Harbor; for one group of mortars and one gun in Boston Harbor; and for one group of mortars and two guns in San Francisco. As this is a matter in which make-shifts from year to year are both expensive and destructive of the object to be attained, I trust that a fixed policy may be adopted in the line of a reasonable yearly appropriation for the completion of the work on which the nation is but just entering. With such a policy manufacturers could safely put in the necessary plants and be able to furnish material at a cheaper rate. With an annual appropriation of eight to ten millions—only a little more than that of the present year—the construction and emplacement of guns and mortars, works of torpedo defense,

for the whole coast, can be carried on, and in ten years our principal harbors and cities rendered reasonably secure.

ORDNANCE.

In the matter of armament a fair and promising beginning has been made. The gun factory at Watervliet Arsenal has already turned out completed steel guns of 3.2, 3.6, 8, and 10 inches caliber, which have been entirely satisfactory so far as their tests have proceeded. The 3.2-inch breech-loading field-gun meets with general approval in service and the firing tests of the 8 and 10 inch type guns manufactured at Watervliet have given excellent results, both as regards accuracy and range, and have satisfactorily demonstrated the capability of the gun factory to turn out modern high-power rifled steel guns equal to the very best. Two type guns, one of 12-inch caliber and the other a 10-inch wire-wound steel gun, both breech-loaders, and a 12-inch B. L. steel mortar are now under construction at the gun factory. It is to be remembered that the work so far done has all been accomplished in a shop improvised from an old timber store-house and with a limited equipment and that the experience gained by both officers and operatives will probably lead to valuable results in the new gun factory.

Under the present contract about thirteen 12-inch cast-iron mortars hooped with steel can be furnished per annum, and as there are other plants in the country besides that of the present contractors which are capable of turning out these mortars it is only necessary that sufficient sums be appropriated for the manufacture of about fifty mortars a year, and the production of mortars will keep pace with that of guns and the construction of emplacements. No fear need be entertained that the plant for this work will not be in existence when needed.

The manufacture of the forgings for 8-inch, 10-inch, and 12-inch breech-loading guns by the Bethlehem Iron Works, under the appropriation of \$1,500,000 made in the act of September 22, 1888, is making good progress, and it is expected that the contract will be completed by November, 1893. The sum appropriated will procure about 61 guns of the calibers mentioned. In short, the art of modern gun-making is now well inaugurated in this country.

The carriages for the 8-inch and 10-inch guns will be of the disappearing type. Several designs of this type are now under manufacture or consideration. The 12-inch guns will be mounted on platforms which will be raised into position for firing by an elevator, and then lowered

out of reach of the enemy's fire to be reloaded and aimed, except when the position is at such an elevation as to make this unnecessary to the protection of the gunners. A design for such a platform and elevator has been approved, and one is now under construction. The inch guns, if any are made, will doubtless be mounted in turrets.

NORTHERN FRONTIER.

By our agreement of 1817 with Great Britain each party is restricted to a single armed vessel on Lakes Ontario and Champlain and two on the upper lakes. Since then the Great West has become an empire in production and population, with its great cities, centers of warlike commerce, and transportation, built on the straight shores of the big lakes and defenseless against naval attack. The Welland Canal and six canals along the St. Lawrence between Lake Ontario and Montreal have been constructed and are wholly in foreign territory. The smallest of the St. Lawrence canals have 9 feet depth of water and locks 100 feet long and 45 feet wide, sufficient for the passage of over fifty of our armed vessels of the British Navy. Measures have already been commenced to enlarge the smaller canals so that none will have less than 14 feet depth of water, which would admit the passage of as many more of a heavier armament. One of these canals, the Beauharnois, 11½ miles long, is wholly on the right (south) bank of the St. Lawrence. Another, is within rifle-shot of islands belonging to us. The Board of Fortifications and other defenses under the act of March 3, 1885, composed of Army and Navy officers and of civilians, of which my predecessor was president, made a full and very complete report in regard to this situation, and recommended considerable works of defense at the lake ports.

In the absence of any preparation on our part the lake cities might, in the event of war with the power holding the highway of the St. Lawrence, be in a more defenseless condition even than the sea-board cities. Although we can not, under the agreement, build armed vessels on the lakes, to overmatch on those waters the force that might be brought against us, I do not think it necessary to undertake any elaborate system of defenses as suggested. With land forces properly disposed we could doubtless ward off any danger from this source, and hence I approve the suggestion of General Schofield, who, of this subject, says:

The military policy of the United States in that direction will not, it is believed, in any conceivable event, require such defense on that frontier. It is proposed to maintain at appropriate points, which have been carefully selected, suitable garrisons.

ens, of regular troops of all arms, as nuclei for the concentration of such forces, regular and volunteer, as any emergency may require in that direction. The wisdom of providing, without unnecessary delay, for the additional accommodations required for these permanent garrisons, will, it is believed, be manifest to all.

Proper preparations are not measures of provocation, but rather of prevention and for the continued preservation of peace.

DESERTIONS.

The number of desertions from the Army for the twelve months ending September 30 were 2,086, as against 2,751 for the same period last year, a decrease of 24 per cent. This result is due to such improvements in the service as could be accomplished under existing legislation. The act of Congress entitled "An act to prevent desertions, and for other purposes," approved June 16, 1890, was passed too late to have had much effect up to this date. Because of the time required to work out its details, the general orders to carry it into operation were not issued till July 26, and could hardly become fully effective at once. The desertions, however, for August and September were 308 as compared with 459 for the same months last year and 515 the year before, a decrease of 33 and 40 per cent.

That act embodies the more conservative and practical suggestions which have been made for lessening this evil. It provides for the retention, until the end of his enlistment, of \$4 per month from a soldier's pay for the first year. This is a pledge for his honorable service, but as it and interest are to be paid the man if he serves honestly and faithfully until the date of his discharge, it is really also a provident feature for the soldier himself. Enlistments are to continue to be made for five years, but after one year's service a soldier is permitted, in time of peace, to purchase his discharge for a prescribed sum, varying with the time he has served, and based upon a re-imbursement of the Government for the actual expense of recruiting and transporting a new man to take his place. At the end of three years of faithful service he is entitled to a free discharge if he desires it. It also increases the vegetable ration, and finally authorizes the arrest of deserters by civil officers. The act proceeds upon the theory that by making it possible to quit the service in an honorable way there will be fewer attempts to do so dishonorably; by offering a possible and reasonable escape from a life that has become a source of discontent, the discontent itself may thereby be diminished.

Although desertions are already greatly reduced, so long as they continue in any considerable numbers they must have a bad effect upon the *morale* of the Army, and entail a large and needless expense. The practical solution of this somewhat vexed question assumes three phases: First, how to make the service more desirable; second, how to remove the artificial restraints which, by binding a man inflexibly to a long service which has become distasteful to him, naturally drive him to desperate means; third, how to make the punishment for desertion so certain, that if more worthy motives fail men may be warned by its fear. As to the second and third there is now legislation enough, at least with our present experience. With respect to the first there is, I think, need of more.

My experience so far confirms an observation which I made one year ago that "the pith of the whole question is to make the service worth seeking, and then enough good men will seek it and be glad to stay in it." So far as this is a question of thoughtful and considerate treatment of the men it has thus far and will continue to engage my earnest attention, and in it I have had the hearty and intelligent co-operation of the officers of the Army. But there is a fundamental difficulty. The pay of a second lieutenant is \$116.67 per month, that of a first sergeant only \$22, and unfortunately this difference in pay largely regulates the actual distance between their relative positions. That distance is too great. The individual elements of the Army are separated by too large a gap for the best interests of either. The pay of a non-commissioned officer is but little more than a private, and the chance to rise above that position very slight. There is little inducement for a bright and energetic man, in a country of so great possibilities as ours, to either seek or to desire to remain in the military service. It would be a step in the right direction to increase somewhat the pay of the non-commissioned officers, that every man who enters the service may find in it the possibility of a modest future.

PROMOTIONS FROM THE RANKS.

With a view to the same end I would recommend a change in the law relative to the selection of enlisted men for appointment to the grade of second lieutenant. The act of June 18, 1878, providing for the promotion of meritorious non-commissioned officers makes a favorable recommendation from a company commander an essential qualification for examination. This requirement to a great extent defeats the purpose

of the statute, by making the privilege depend absolutely upon the discretion of the officer for the time being in command of the company. For example, a man in the opinion of one company commander entitled to advancement might be regarded by another as below mediocrity. Men serving with captains who hold high standards may be infinitely superior to comrades recommended for promotions from other organizations. The result being that the advantages of the law may be withheld from men entitled to more consideration than many of the successful competitors.

Practically, it is now possible for company commanders to give these valuable appointments to young men who have enlisted for that sole purpose, and who have not rendered any meritorious service, except to qualify for the examination, thus excluding bona fide soldiers who have been induced to enlist in the hope of obtaining hard-earned and legitimate promotion. The present system gives a great opportunity for favoritism. Doubtless there have been cases of it, and there is danger that the abuse may become a very serious one.

In order to insure exact justice to all, and give full effect to the beneficent purpose of Congress, the initiatory step should be with the men themselves. Any enlisted man of two years' service, who is a citizen of the United States, should, under certain fixed rules, be permitted to compete for a commission. By this means the operation of the law would be made absolutely impersonal, and every man entering the Army would be impressed with the fact that he had an exact and even chance for a commission. This information extensively disseminated would, it is hoped, further recommend the Army to desirable men.

With your approval a bill embodying the suggestions of the Department, with respect to this matter, will be submitted to Congress at an early date.

THREE-BATTALION FORMATION.

As a military question there is no difference of opinion as to the advisability and necessity of the three-battalion formation for infantry. Every European power has adopted it, and all of the leading generals of our country, including Grant, Sherman, and Sheridan, have recommended it. Now that our small army can be stationed in larger posts, the conditions of service are fully suited to its use. It already prevails in the other arms of the service, and there are even stronger reasons for it in the infantry; besides all ought to be uniform. If we were

ever met by a military contingency, we should then be forced to adopt it, and without proper preparation. Officers are regularly detailed to instruct the militia and colleges, and they necessarily instruct in that system of organization which is recognized and fixed by our laws. The country will not adopt a higher standard of military organization than that which the Government offers to it as a model. Our Army is simply a nucleus, a skeleton organization on which to build in case of necessity, and a correct organization is more important than numbers. If the present system is as erroneous as all military men agree in saying it is, and I believe that to be the case, there ought to be some way found for making the required change. As the matter requires legislative action I can only commend the subject to the careful consideration of Congress.

The reasons for the recent reduction in the number of companies, adopted on the recommendation of General Schofield, have been fully discussed in his report, and he points out that this change is an argument in favor of rather than against the three-battalion formation.

ARTILLERY.

A bill for the reorganization of the artillery has already passed the House and awaits the action of the Senate. No objection has, to my knowledge, been raised to it, and, as its desirability in order to meet the changed requirements of our service has already been so fully discussed, I think it is unnecessary for me to add anything at this time to what I said relative to this matter in my report for last year.

RETIREMENT OF OFFICERS.

By law the officers must be retired when they reach the age of sixty-four years, and may be retired on their own request after forty years' service; but very few avail themselves of this privilege. Such retirements are now unlimited, but the number of all other retirements is restricted by the statutes to four hundred. That is, enforced retirements made in pursuance of a general policy can be made without limit while the only retirements which are made because of the actual present incapacity of the officer to perform duty are expressly restricted. Retirements ought to be carefully limited in some proper way. The retired list, or any privileged class, should be strictly confined within the narrowest limits compatible with the necessity which requires its creation. But, having such a law, it should be a just one—just to the officers it is intended to benefit and just to the service it was intended to relieve.

The number of officers now awaiting retirement is about sixty. These men are performing no service whatever, but receive full pay, while junior officers doing their duties for them are unjustly deprived of both the pay and the rank which the law intends to attach to the positions they are filling.

Of the four hundred officers on the limited retired list fifty-three were retired by reason of the loss of a limb, and ninety others, making one hundred and forty-three in all, were retired for wounds. Only eighty-seven of the four hundred are West Point graduates, and all but twenty-three of the whole number served in the war of the rebellion. The limited retired list is a legacy of the war. In about one-half the cases the records show affirmatively that the retirements were made for disability contracted during that period. In fact, by direction of the act of July 28, 1866, some of these 400 officers were appointed in the regular Army at its close because of their wounds; and of substantially all it may be said that after having undergone the severe strain of the war they were the more readily disabled by their subsequent service and exposure in the Indian campaigns. It is to be observed also that these men, if not in the Army, would be generally drawing large pensions.

The incongruity of the present law is illustrated by the fact that where an officer is disabled in the line of duty, instead of opening the way for the promotion of juniors, it may and often does actually retard it. An officer put upon the limited retired list remains there so long as he lives, even if he survives the age of sixty-four by many years, thereby preventing the retirement of another officer and the consequent promotion of juniors. If he had been retired for age in regular course this could not occur. The limit now established is proper enough if the law were so amended that this limit could be construed according to the reasonable intent of its purpose. An amendment providing for the transfer of officers from the limited to the unlimited list when they reach the age of sixty-four would still permit only four hundred retirements other than those who *could* be retired for forty years' service or by virtue of the sixty-four years provision. Whatever the limit be, such is the only reasonable basis for it. A bill to that effect is already pending in Congress, and if it be enacted I believe that with the limit as it now is the evil will correct itself.

VOLUNTEER RECORDS.

On the 8th and 16th of July, 1889, I transferred to one division, to be designated the "Record and Pension Division of the War Depart-

ment," all the hospital and service records of the volunteer armies in the war, and all business in the Department pertaining to volunteer soldiers. This consisted chiefly of calls from the Pension Office for information necessary for the adjustment of claims for pensions. It also included cases from the Second Auditor for evidence required in the settlement of old accounts and a large amount of miscellaneous business relating to information required by States, Soldiers' Homes, the Grand Army of the Republic, and other organizations entitled to it. When this change was made there was on hand an accumulation of unadjusted and unanswered cases as follows:

From the Pension Office.....	23,424
From the Second Auditor.....	5,607
Remuster cases.....	4,365
Desertion cases.....	1,342
All other cases, miscellaneous.....	6,516
Total.....	40,654

There were received from July 8, 1889, to the end of the fiscal year, June 30, 1890, 301,238 cases, as follows:

From the Pension Office.....	199,350
From the Second Auditor.....	35,487
Remuster cases.....	4,326
Desertion cases.....	8,509
All other cases, miscellaneous.....	53,657
	301,238
Add cases on hand.....	40,654

Total.....	341,892
There have been acted on and answered.....	341,892

On hand June 30, 1890..... None.

A record is now made each night of the number of unanswered cases left over from the day's mail, which shows that during the last two months 97.6 per cent. of all cases have been answered within twenty-four hours of their receipt. Six hundred and forty-six clerks were assigned to the division in July, 1889, of whom 458 were engaged on the current work, and 188 in copying the original records, which were rapidly going to destruction. Since then 261 clerks have gradually been transferred from current work to the necessary and permanent work of the preservation of the records, so that at the end of the fiscal year the current business of the office was being done by 197 clerks, a reduction in force of 57 per cent., although that business has in the mean time materially increased. The report of the officer in charge of this division contains much interesting information concerning the

detail of the above and a very full and complete explanation of the improved method by which these results have been obtained.

Similar cases relating to service of regular troops during the war has been attended to in the office of the Adjutant-General, who reports that the whole number of cases received by his office during the year was, from Pension Office, 7,502; from Second Auditor, 26,392; others, 573; total, 34,467, which, with thirty-one cases on hand, have all been attended to promptly, leaving none on hand at the end of the year.

REBELLION RECORDS.

The publication of the Rebellion Records since the reorganization of the work in July of last year is progressing as satisfactorily as possible in the view of the size of the appropriation. The great item of expense is the printing, and that can only be completed as funds are available. A large part of the appropriation for the past year has been devoted to the printing and distribution of volumes already in type. Ten books were published and distributed containing the accounts of the Chancellorsville and Gettysburgh campaigns and the important sieges of Vicksburg and Hudson. In the preparatory work seven more books have been stereotyped and twelve indexed, of which eleven were ready for publication at the end of the fiscal year, thus carrying the official accounts to the end of 1863. Forty-five books have been published and distributed up to June 30, 1890.

SIGNAL CORPS.

By the act approved October 1, 1890, the Weather Bureau Service, which has heretofore been under the charge of the Signal Corps, is to be transferred on the 1st day of next July to the Department of Agriculture. The growing importance of this service, in its general interest to the country, has resulted in its development and extension to the detriment of the original purely military duties of the Signal Corps. The disassociation of the two must certainly place upon a more favorable basis this very important though small branch of the military service. There has already more attention been paid to it during the past year than heretofore. Three hundred and ninety-three officers of the line, representing for the first time in many years every regiment in the Army, have been under instructions, and at least 1,500 of the enlisted men.

MILITARY POSTS.

The policy of the Department to concentrate its troops at larger posts as rapidly as the requirements of the service would permit has been

carried out during the year, and sixteen posts have been given up and the reservations turned over to the Department of the Interior, in order that they might be taken up by the people for private use. This has only been done, however, where it was felt that the presence of the troops in those particular localities was no longer necessary, and that their maintenance there was making needless extra expense.

POST TRADERS.

During the year the licenses of forty-two post-traders have been revoked, and only two new traders have been appointed, leaving the total number of traders at present in the service thirty-four. In the earlier history of the West, when military posts were upon the extreme frontier, some such system as that of post-traders was necessary. Since then towns and cities have generally grown up in the close vicinity of posts, and which have merchants who can now furnish to the garrison such stores as a post-trader has usually kept. It is believed to be wise policy to discontinue as rapidly as possible a privileged class and permit the trade of military posts outside of regular governmental supplies to take its regular channels.

NATIONAL GUARD.

Being impressed with the importance of an effective militia as a prominent and necessary factor in any military organization suited to our country, the Department has endeavored by its co-operation to encourage and aid the National Guard so far as possible under existing law. Officers have been detailed to assist in their instruction, and detachments of regular troops have been ordered to participate in some of the larger State encampments. The Department has endeavored to co-operate more especially with those States which have manifested the most interest in the matter by their own liberal appropriations and earnest efforts. The results have been very satisfactory. Its direct benefits are palpable, and its indirect influence perhaps even more important.

Any money which the National Government expends for our citizen soldiery goes to help those who help themselves, and is bound to give proportionately large returns. Under the present law there is annually appropriated for the benefit of the militia \$400,000, while the individual States appropriate in the aggregate, so far as known, over \$2,000,000, and in many States the militia receive also a considerable support from

local and private sources. If the appropriation of the General Government should be increased, and I wish it might be, I believe that it would be generously met by a corresponding increase by the States themselves. I heartily commend every intelligent effort to increase the efficiency of the National Guard, and to bring them into closer relations with the War Department, and hope that measures to that end may receive favorable consideration of Congress. One of the most useful directions which can be given to the drill and training of the militia of the seaboard States is in connection with coast defenses, where its services are most likely to be needed, if at all. In that particular training the General Government must do more than co-operate; it must take the initiative.

COLLEGES.

To secure better co-operation between the War Department and the agricultural colleges, and other institutions at which officers are serving as instructors under the act of Congress authorizing such details, a circular was issued in February last after full consultation with and approval of a committee of college presidents, defining the relations of these officers to the institutions. It is believed that this action will secure greater uniformity and efficiency.

There are applications from leading institutions for more officers than can be detailed under the law; and I would recommend that the act be so amended as to allow the detail of seventy-five officers from the Army, or at least one for every million of inhabitants at the last preceding census. This would allow for future increase if necessary.

RELIEF OF SUFFERERS FROM THE OVERFLOW OF THE MISSISSIPPI.

Congress, by joint resolution of April 25, 1890, appropriated \$150,000 to be expended by and under the direction of the Secretary of War for the purchase and distribution of subsistence stores to such destitute persons as might require assistance in the district overflowed by the Mississippi River and its tributaries. Stores were distributed thereunder, as follows:

State.	Pork.	Bacon.	Flour.	Cornmeal.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Tennessee	31,432	30,090	54,880	56,791
Arkansas		91,065	77,659	65,471
Texas		10,402		17,800
Mississippi		167,498½	95,917	172,508½
Louisiana		730,696½	496,639	680,545
Total	31,432	1,038,721½	725,093	993,115½

The amount of the appropriation used in the purchase of supplies and their distribution amounted to \$105,200, leaving \$44,800 of the appropriation unused, which balance was afterwards reappropriated by Congress to the Territory of Oklahoma. Capt. J. F. Weston, commissary of subsistence, was immediately charged with making the purchases and distribution of these stores, with headquarters at New Orleans, and with such officers detailed to assist him as were required.

Captain Weston was necessarily given large discretion in the performance of this work, as the information received was oftentimes conflicting and the necessity pressing. It was the effort of the Department to supply the destitute and carry out the purposes of Congress in granting an appropriation, but at the same time to guard against imposition, and to see to it that the bounty of the Government reached the deserving and was carefully and prudently distributed. The legislature of the State of Louisiana has formally communicated to the Department an engrossed concurrent resolution extending the thanks of their State to Congress and the Executive for the prompt and generous action of the Federal authorities.

MONUMENTS.

No action has been taken towards procuring the pedestals for the statues of Generals Sheridan and Logan under the act of March 2, 1889, for the reason that the character and size of the statues have not been fixed upon by the respective committees of the army associations having the matter in charge. There is no provision for a statue for General Hancock; and I would suggest that the law appropriating \$40,000 for the pedestal be amended so that any balance not required for the pedestal may be applied toward the purchase of the statue. A suitable pedestal can probably be procured for about \$25,000.

The monument to General Lafayette and his compatriots, authorized by the act of March 3, 1885, has been received from the sculptors, but, on account of the joint resolution of September 30, 1890, was not put in place. The Commission has now fixed upon a location at the southeast corner of Lafayette Square, and work will soon be commenced on the foundations.

EXPLORATION OF ALASKA.

The area of Alaska is estimated at nearly 600,000 square miles. It is therefore about one-fifth the size of the United States, or nearly equal to the combined areas of the New England, Middle, and Southern States east of the Mississippi River. Of the interior of this vast area

we are practically ignorant. Three or four reconnaissances have been made by officers of the Army through portions of the Territory, and the courses of several of its great navigable rivers have thus been determined. These expeditions, however, were inadequately prepared for the work of exploration, the journeys were necessarily made in very great haste, and were confined to the rivers. No systematic exploration of the interior has ever been attempted by the Government, and the topography, resources, and capabilities of Alaska are practically unknown.

In order to obtain exact and trustworthy information concerning this Territory I have approved a proposition to organize a thoroughly equipped expedition to make a systematic exploration and survey of Alaska. The duty will be arduous and trying at the best, but it will be cheerfully undertaken both by competent officers and by the men and with, in my opinion, a fair prospect of important results. I recommend that a sufficient appropriation be made by Congress for carrying the plan into effect.

EXPENDITURES, APPROPRIATIONS, ESTIMATES.

The expenditures of appropriations under the direction of the Secretary of War for the fiscal year ended June 30, 1890, were as follows:

Salaries and contingent expenses.....	\$1,940,700.74
Military establishment: Support of the Army and Military Academy..	23,961,309.95
Public works, including river and harbor improvements	15,382,785.62
Miscellaneous objects	6,072,960.11
Total.....	47,357,756.42

The appropriations for the present fiscal year, ending June 30, 1891 are as follows:

Salaries and contingent expenses.....	\$2,137,782.33
Military establishment: Support of the Army and Military Academy..	21,513,596.90
Public works	30,874,185.00
Miscellaneous objects	5,211,131.22
Total.....	62,739,695.45

The estimates of this Department for the next fiscal year ending June 30, 1892, are as follows:

Salaries and contingent expenses.....	\$2,074,430.00
Military establishment; support of the Army and Military Academy..	26,100,991.77
Public works	10,700,288.93
Miscellaneous objects	4,805,226.07
Total.....	43,710,936.77

The statement of appropriations, expenditures, and the balances on hand at the end of the fiscal year ending June 30, 1890, is appended to this report and submitted herewith, as required by law.

REPORTS.

I desire to call attention to the very full and complete report of the Major-General Commanding, particularly with reference to the re-organization of the Army and the matter of coast defense. General Schofield in greater detail has enforced the views which I have herein expressed and which with me he deems of the greatest importance. I ought to add, also, that I have had the hearty co-operation of the several bureaus and divisions of the Department and that they have done excellent work, which the individual reports of their chiefs more fully show. I would refer to these several reports and to the report of the Superintendent of the Military Academy for much detailed information concerning the Army, the Academy, and the work of the Department. Also for many valuable suggestions which they have so fully and clearly presented that I deem it unnecessary to add to what they have said. I have thought it best, therefore, to not attempt any recapitulation of their reports, but to leave them to speak for themselves, while in the foregoing I confined myself to those matters only which I have desired to discuss because of some particular duty charged upon me in connection therewith, or on account of their general interest to the whole Army or to the country.

REDFIELD PROCTOR,

Secretary of War,

PAPERS

ACCOMPANYING

THE REPORT OF THE SECRETARY OF WAR.

REPORT OF THE MAJOR-GENERAL COMMANDING THE ARMY.

HEADQUARTERS OF THE ARMY,
Washington, October 23, 1890.

SIR: I have the honor to submit herewith for your information the annual reports of the several commanding generals of divisions and departments, the commanding officer of the Artillery School at Fort Monroe, Va., and of the Infantry and Cavalry School at Fort Leavenworth, Kans., and those of the Adjutant-General and Inspector-General of the Army.

These reports give in full detail all the operations of the troops during the last year, their condition as to discipline and instruction, the changes that have been made in the stations and in the organization of divisions and departments, and in general all that is needed for complete and precise information in respect to the work that has been done by the line of the Army during the past year and its present condition.

These reports also contain valuable suggestions relative to the necessities of the military service, to which your attention is respectfully invited.

The Army in the past year has suffered a great loss in the death of Maj. Gen. George Crook, so long distinguished for ability as a commander, for fidelity in the discharge of every duty, and for honorable and humane treatment of even the most savage tribes of Indians who fell under his control during his long and most valuable service in the Indian country.

General Crook has been succeeded by General Nelson A. Miles in the office of major-general and in the command of the division of the Missouri, as modified in territorial extent by the Executive Order of August 8, 1890. Brig. Gen. John Gibbon has been assigned to the command of the Division of the Pacific, now consisting of the departments of California and the Columbia, while Brig. Gen. Alexander McD. McCook, who succeeded to the rank of brigadier-general upon the retirement of General Grierson, has been assigned to the command of the Department of Arizona. The other commands remain the same as at the date of the last annual report, except that the commanding generals of the departments of the Missouri, of Texas, and of Arizona now report directly to headquarters of the Army, instead of through division headquarters as heretofore.

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The important question of national defense against any possible foreign aggression has also received no little attention from the public, and the policy dictated by the military principle recognized among all nations appears to have received the general indorsement of the people and of Congress. Yet it is natural that public necessities which are not always present in the public mind are apt to be overlooked in the midst of those interests which present themselves constantly to the view of the people. It may therefore not be amiss to repeatedly invite attention to those public necessities which are constantly apparent only to those whose official duty it is to devote their entire time and ability to the consideration of such special interests.

The time has now come when the future possible or probable military necessities of the country should dictate military policy. The small regular army should be so stationed that it may be prepared at the shortest notice to respond to any call which may be made upon its services, and at the same time to assist in all practicable ways in preparing the much larger body of the militia of the several States, or national guards, for active service in time of need.

It is believed to be so manifest to all who will consider the subject that demonstration is unnecessary that the important seaboard cities of the United States should be so fortified, armed, and manned as to be capable of self-defense against the attack of any foreign fleet and that each of the great sea-coasts of the United States should be provided with an adequate fleet of sea-going battle-ships capable of attacking upon the broad ocean any hostile fleet which might attempt to blockade its harbors or destroy its commerce. If the important sea-ports are adequately fortified and armed, one such fleet, it is presumed, will be sufficient for each of the great oceans.

It may be confidently stated that among military men there is seen no ground for difference of opinion on this subject, namely, that an adequate sea-coast defense requires both the fortification of each of the great sea-ports and the provision of an adequate fleet to take the part of the "offensive defensive" in the event of war with any foreign power.

The general plans for the fortification and armament of the sea-coasts of the United States have been carefully outlined under a board appointed in pursuance of an act of Congress, that of March 3, 1885, and of which the then Secretary of War was president.

In respect to the recommendation of this board, a single modification only has been suggested, namely, that respecting the fortifications and armament upon the northern frontier. The military policy of the United States in that direction will not, it is believed, in any conceivable event, require such defense on that frontier. It is proposed to maintain at appropriate points, which have been carefully selected, suitable garrisons of regular troops of all arms as *nuclei* for the concentration of such forces, regular and volunteer, as any emergency may require in that direction. The wisdom of providing, without unnecessary delay, for the additional accommodations required for these permanent garrisons will, it is believed, be manifest to all.

Although the work of preparation for fortification and armament was but recently commenced, satisfactory progress has already been made in the construction of a gun factory at Watervliet Arsenal and in the fabrication of experimental guns and mortars of the highest type. Preparations are also in progress for the necessary foundations to support these guns in their appropriate positions for the defense of the most important sea-coast cities and harbors.

There is believed to be no room for doubt that the United States are

now able to manufacture guns and other implements of war quite equal to the best that can be made anywhere else in the world, and it is earnestly hoped that Congress will continue to make such moderate appropriations as may be manifestly necessary to carry this work steadily forward, until all the great seaboard cities are placed beyond the danger of injury by foreign attack.

It should be borne in mind that these measures are in no proper sense preparations for war. They are, on the contrary, those preparations which are indispensable to the security of peace. Considering the enormous latent strength and resources of the United States, no foreign power would think for a moment of attacking this country, unless it was found in a state of unpreparation for immediate defense, in which condition enormous damage might be done by even a greatly inferior power, which damage could not be repaid by any possible reprisals which this country might afterward make. It is hardly possible to over-estimate the damage that would be done to the business prosperity of this country by such even temporary interruption as would result from hostilities. The expenditure necessary to make such interruption practically impossible would amount to a very small rate of insurance upon the property and business interests endangered by the neglect of that insurance.

These general propositions are so self-evident and they have been so frequently stated and so generally accepted by the public that it seems almost superfluous to repeat them; and it is done here only for the reason that other public needs, apparently more urgent, naturally absorb the public attention. But by those whose special duty it is to consider all things pertinent to the national defense it is earnestly hoped that these military interests will receive from the public and from Congress all due consideration.

The military forces of the friendly republic of Mexico have co-operated in a most cordial manner with the troops of the United States in the pursuit of the few criminal savages who have sought refuge in the mountains of the one country after committing their crimes in the other. It is believed that very few of these criminals now remain at large.

In like manner, along the Lower Rio Grande, mutual assistance has been rendered in the prevention of such lawless incursions from the one country to the other as are inevitable under such circumstances, except for the presence of adequate national force.

It seems probable that such efficient police work may be required of the troops for some years to come. Otherwise, there is no present or prospective necessity apparent for the presence of any considerable military force on our Southwestern frontier. Adequate garrisons are already at those several places, and only require some additional but not very expensive quarters to provide for all prospective necessities.

The wisdom of Congress determines the strength of the military forces to be maintained in time of peace, as well as of those which may be called forth in time of war. The duty of subordinate military officers acting under the Executive is to make such forces as effective as possible.

With this end in view and accepting in general terms the present limit of a permanent military establishment as that upon which this duty is to be exercised, much attention has been given to the consideration of the measures necessary to make this small force most effective and most useful.

* * * * *

INFANTRY.

Twenty-five regiments of infantry, of which eight companies shall be with the colors and each company to be composed of—

First sergeant	1
Sergeants	4
Corporals	4
Musicians	2
Artificers	2
Wagoner	1
Privates	56

Aggregate 70

To each regiment:

Eight companies of 70 men	560
Non-commissioned staff and regimental non-commissioned officers	5
Total	565

CAVALRY.

Ten regiments of cavalry of twelve troops each, of which ten shall be with the colors and two unorganized; each organized troop to be composed of—

First sergeant	1
Sergeants	5
Corporals	4
Trumpeters	2
Farriers and blacksmiths	2
Saddler	1
Wagoner	1
Privates	54

Aggregate 70

To each regiment:

Ten troops of 70 men	700
Non-commissioned staff and regimental non-commissioned officers	5
Total	705

ARTILLERY.

Seven regiments of artillery of twelve batteries each, of which eight shall be heavy and two light, two unorganized. Each organized battery shall be composed as follows:

Heavy:

First sergeant	1
Sergeants	4
Corporals	4
Musicians	2
Artificers	2
Wagoner	1
Privates	56

Aggregate 70

Light:

First sergeant	1
Sergeants	6
Corporals	4
Musicians	2

Light—Continued.

Artificers	2
Wagoner	1
Privates	69
Aggregate	25
To each regiment:	
Eight heavy batteries of 70 men	560
Two light batteries of 25 men	170
Non-commissioned staff and regimental non-commissioned officers	5
Total	735

RECAPITULATION.

Infantry, 25 regiments (8 companies each)	14, 125
Cavalry, 10 regiments (10 troops each)	7, 050
Artillery, 7 regiments (10 batteries each)	5, 145
Total for line of the Army	26, 320
Engineer battalion	500
Ordnance Department	450
West Point detachments (including Army service men in the quartermaster's department) and Military Academy band	224
Prison guard (Fort Leavenworth)	110
Ordnance sergeants	90
Commissary sergeants	120
Post quartermaster sergeants	80
Depot detachments	315
Indian scouts	476
	2, 365
Recruits at depots, including a battalion of young men under instruction	1, 315
Authorized enlisted strength	30, 000

In conclusion, I beg leave to say that the several measures recommended by the Secretary of War and enacted by the present Congress will, in my judgment, prove of great and lasting benefit to the military service; and I believe the efforts of Congress and of the Executive to increase the efficiency and usefulness of the military establishment are cordially appreciated and seconded by the officers and men of the Army. The zeal and fidelity with which the duties of the Army have been performed merit my commendation.

Very respectfully,

J. M. SCHOFIELD,
Major-General Commanding.

Hon. REDFIELD PROCTOR,
Secretary of War.

REPORT OF THE ADJUTANT-GENERAL.**CANTEENS.**

At the date of the last annual report the canteen system (formally authorized by General Orders, No. 10, dated February 1, 1889), while giving promise of full realization of the anticipations which led to its adoption, had not been extensively developed, owing to the impracticability at a majority of the posts to secure the necessary buildings and

fit them for occupancy. Through the zeal of officers interested in the scheme great progress has recently been made, and the preliminary details having been accomplished, the institution may be regarded as permanently established.

At present canteens are in successful operation at 68 posts, and during the six months ended June 30, 1890, transacted a business of \$474,623, with a resulting profit of \$88,430.

Some misconception has grown up in the public mind in regard to these institutions, engendered, no doubt, by the generic term used as a designation. The word "canteen" has contracted a specific meaning from many years of use in European armies, and is generally understood as describing a drinking place, where soldiers assemble for more or less vicious revelry. As conducted in the American service, the canteen is simply a co-operative establishment, in which a general business, under careful military supervision, is conducted in the sole behalf of the enlisted men of the Army.

The testimony of officers who have reported on the practical operation of canteens confirms the wisdom of the action of the War Department in fostering and encouraging the extension of the system. There can be no question that it has contributed largely to the comfort and contentment of enlisted men, and thereby improved and strengthened discipline throughout the service.

As illustrating accomplished results and exemplifying the character of these establishments, the following extracts from reports received at this office will prove both instructive and interesting:

The commanding officer of Fort Meade states:

The building is one story high and, in addition to school-rooms, library, etc., not directly under the control of the officer in charge of the canteen, consists of one large lunch-room and general store, bar-room, billiard-hall and reading-room, store-rooms, kitchen, office, and dormitory for use of the attendants. As a part of the canteen, too, there is a good-sized stage at the end of the post hall; this is suitably provided with drop-curtain and scenery bought on three months' time. An enlisted men's dramatic association is endeavoring to pay for this, with fair hopes of success. If its efforts are not successful, it is the intention to have the debt paid at maturity by the canteen. Arrangements have been made with the manager of the opera-house in Deadwood by which all theatrical troops playing in that city will give at least one performance on this stage. Funds derived from use of hall for such purposes will be devoted to paying for scenery.

There are also two rooms reserved for use of officers. These rooms are furnished and maintained at the expense of the canteen, and all profits arising from sales therein will be for the benefit of the canteen. The same articles, and no others, will be sold here that are sold to the enlisted men. No ardent spirits will be permitted to be introduced here. Police and maintenance of order in these rooms will be in the hands of the officer in charge of the canteen. These rooms will be open on or about January 1, 1890.

The canteen found itself very fortunately situated in one respect, viz. in being able to at once make use of the permanent stock of the Eighth Cavalry canteen, mentioned above. Regimental canteens being no longer permissible under the regulations, the latter institution had to give way, and had its entire permanent stock for disposal. All this stock was immediately turned over and has been in constant use since. Subsequently it was appraised by a board of officers at \$1,200, and bought at that price. The means for furnishing the billiard-rooms were at once available; and in that of the men two billiard-tables and one pool-table and in that of the officers one billiard-table were put up. These tables, together with the games and other means of amusement comprised in this property, have been a source of much amusement and pleasure to the enlisted men, who make a frequent and a constantly increasing use of them. By means also of this property the canteen came into possession of all the tools, utensils, etc., necessary to a large lunch and bar business.

The salable stock was bought on credit. Drummers and business men, upon looking thoroughly into the proposed business, did not hesitate to give ample credit. The stability of such a business, with slight expenses, and no losses to be apprehended from bad debts, was apparent at a glance, and the canteen soon had drummers vying with one another for its trade. The canteen was opened for trade on the pay-day

following the October muster, and since that day has been in successful operation. During November credit was given the men to the amount of \$34.40, and it was promptly repaid on the next pay-day in December, not one cent being lost by defaulters.

The report from Fort Snelling, one of the large posts of the Army, states :

For three months prior to the opening of the canteen sixty-three men were confined ; for the three months subsequent forty-three men were confined ; during both of these periods the command averaged three hundred men. In other words, for the three months previous to the opening of the canteen 21 per cent. of the command was confined, and for three months subsequent 14 per cent. was confined, showing a decrease of 33½ per cent. for the latter period as against the former.

From Fort Sidney, Nebr.:

The canteen has now become an established institution in the United States Army, and its merits are so many and so great that I think it altogether improbable it will ever be disturbed. It may be improved upon, but will never be dispensed with. After ten years' continuous careful observation of the effect of a canteen upon the well-being and general *morale* of commands, I am prepared to say that when properly conducted it is a beneficent institution at a military post. It allays discontents, is a great source of economy to the enlisted men, keeps those in the garrisons who would otherwise find their social enjoyments beyond its limits, enables men to preserve their self-respect by keeping them from public drinking places and other questionable resorts, reduces the use of strong intoxicants to a minimum, affords orderly, clean, and well-lighted rooms in which the men can enjoy themselves with games and innocent amusements without being brought in contact with the reckless and disorderly elements of civil society, and promotes sociability and good manners among the men of different organizations. It has been observed in this command that larger amounts of money are deposited with paymasters when the canteen is in successful operation than at any other time. It is a fact, which has been noticed by merchants, that soldiers in garrisons where there are well-conducted canteens expend more money in articles of dress and comfort than do soldiers at garrisons not similarly situated.

From Madison Barracks, New York :

In my opinion, no step has been taken for the improvement of the moral, social, and intellectual condition of the enlisted men more efficacious than the establishment of the canteen. With pride I am able to say that in discipline and general good conduct I have a command superior to any I have ever seen in the Army. As my general rules and mode of command have not changed, as this post differs from others only in being surrounded with even more numerous grog-shops and other temptations, I can attribute the very marked improvement only to the very wonderful influence of the canteen. I hope that this powerful influence may be extended to the whole Army, and that posts now controlled by the political, social, or moneyed power of post-traders may soon enjoy the benefits accorded to my command.

By the act of Congress making appropriations for the support of the Army for the current fiscal year it is provided that no alcoholic liquors, beer, or wine shall be sold or supplied to the enlisted men in any canteen in States or Territories in which the sale of alcoholic liquors, etc., is prohibited by law. Six posts in Kansas and South Dakota fall under the operation of the law, but the latter is of too recent date to permit any conclusions being reached as to its ultimate effect on the canteens at the posts referred to.

CHAUNCEY MCKEEVER,
Acting Adjutant General.

Maj. Gen. JOHN M. SCHOFIELD,
Commanding the Army.

REPORT OF THE INSPECTOR-GENERAL OF THE ARMY.

WAR DEPARTMENT,
INSPECTOR-GENERAL'S OFFICE,
Washington, D. C., October 1, 1890.

It is as evident this year as last that the demands upon military attention are novel, pressing, constant, and increasing. Re-armament and reorganization, an improved recruiting system, new drill-books, a modified system of pay, better rations, closer scrutiny of expenditures, closer ties with the militia, better instruction at the schools and colleges, new strategic posts, broad plans for national defense, higher demands upon the officers, and practice with masses and in the field are numbered among the matters now receiving attention. The Army has never been more diligent nor more deserving the confidence of the country, nor more important to the future, than at this transition period when one year enforces changes as great as a century once caused. It is also evident from the special merit and high public services of its superior officers, their important commands, their deserving deeds, and as a matter of proper organization, and in order to promote subordination and efficiency, that the Army should now be commanded by a lieutenant-general.

Perhaps the full enforcement of the canteen order (General Orders No. 10, Adjutant-General's Office, 1889) has caused as much labor as any; but it too has reached the high tide of approval. Its success accompanied the addition by law of a pound of fresh vegetables to the ration. The act of June 16, 1890, seems almost a marvel of beneficial legislation, its benefits had been petitioned for so long and still seemed so remote. The men enjoy the change, but some may not appreciate it as fully as their company commanders, who were struggling to procure for them, the kind and quantity of food that is theirs now as a matter of course. And now the army is well fed as far as the cooks are capable, and will continue well and fully fed as long as none of this money is diverted away from the purchase of food. So the Army has fair cause to remember how some comforts came to it in the '90's.

The post school order (General Orders, No. 9, Adjutant-General's Office, 1889), is just beginning to have effect; and now gymnasia, riding balls, and drill-rooms are recognized at last as essentials for military instruction. So the preliminary instruction of the private soldier is assured; and the professional information of the commissioned officer is made certain by the act of October 2, 1890. But the proper instruction of our non-commissioned officers is not yet reached, indeed it is hardly attempted; though the admirable organization and results at Fort Monroe is a standing illustration of what very excellent work of this kind can be done at every post where the officers will devote themselves to the best possible instruction of their men. A change from the old methods produced admirable results at Fort Myer also. And the old methods pursued with broader aims, attained fine results at Fort Leavenworth. These will do for examples. As we need some 4,000 non-commissioned officers, and they are the back bone of our Army, it is evident this is not an unimportant matter. The evident weakness in the system of post school instruction is that no adequate and definite work is

made the special duty of the commissioned officers connected with the schools, and there are no special officers at department headquarters to supervise this work, so a reputation may be made or marred by the results attained. By the special zeal of local officers some admirable results have been reached as at Angel Island.

But, of course, the best non-commissioned officers can only be obtained by having the best attainable material to select them from, so they can profit fully from every opportunity offered them to learn the profession of arms. Men do not enter the Army on a competitive examination except through West Point. Heretofore the private soldier was only asked to have some mind and an absolutely perfect body. Now, careful inquiry has been instituted into his average moral standing as a civilian. Only a small per cent. of the applicants were accepted on purely physical tests. Now that none but true men are admitted at all into our Army, the rejections are growing beyond all proportions ever known before. And desertions show signs of diminishing, too. With every elevation of the standard of admission, rejections must increase. Only those who assert soldiers are mere food for gun-powder can think bodies alone are required for them. But are we not ready to expect an Army thoroughly informed throughout every grade and trained to meet every incident and emergency of war from the lowest to the highest? To be a fair representative of our country we need such an Army, and such an Army America would be justly proud of. Every effort to elevate our Army into a fairly representative one seems commendable. Its *personnel* deserves now the highest commendation for its wonderful readiness and capacity for all the demands of service in front of an enemy. And it has been submitted that the best method of producing, if possible, a still better trained Army in our country is to adopt the method which experience in every other walk of life has proved necessary, viz, take boys and train them for the purpose. Then time enough, say two years, will be given to train each individual, and only those will come out of the apprentice battalion into the other companies who are capable of reaping every reward and performing the highest duties of whatever grade they may attain in our military service. Such a preliminary training and early start will give the men in the ranks a fairer chance in the race of life where some are now handicapped by age.

In my last annual report a brief allusion was made to the subject of the advisability of establishing an apprentice battalion system in connection with the Army. This matter has been very thoroughly discussed by Army officers and the verdict rendered by these authorities is that the system is not only feasible and advisable, but an actual necessity; being a plan which is presented not as an experiment, but as one which has been thoroughly tested and heartily approved in the Navy.

The advantages of the apprentice battalion to the youths of the country will be great. The proposition is to enlist lads not younger than sixteen nor older than eighteen years and give them a course of military instruction, as well as the rudiments of an English education; and at the end of their term of enlistment of three to five years they may either enter regularly into the Army or go back to the walks of civic life. It is presumed that worthy youths will flock eagerly into the ranks of the apprentice battalion, affording, as it will, not only a free education, but profitable employment at exactly the age when lads begin to cast about for means of maintaining themselves, and promising them a career of usefulness and honor. Even if they should not enlist regularly in the

Army, the instruction and military training which they will receive in the apprentice battalion will certainly be of great benefit to them in whatever business they may pursue in civil life.

It is not, in the main, so much a matter of importance that the military apprentice shall enter the regular Army at the close of his apprenticeship, as that the country should have distributed throughout the mass of its citizens a certain per cent. of trained and educated soldiers, ready and willing to rally to the defense of their native land whenever occasion might require them to do so. Surely the little leaven of such a contingent scattered over the country might safely be depended upon to leaven the whole of our arms-bearing population when war come,—as come they inevitably must. In times of war model non-commissioned officers are invaluable. We possibly may not expect to have enough of these in the first days of war, but the apprentice battalion would give us at least a few. And nowadays, when it seems wars are half fought before they are formally declared, no time will be given us to train officers. And if all Americans are born generals, still some training will not injure them.

The benefits of the apprentice battalion would prove as great to the army as to the country, and to the young men themselves. Unfortunately, as matters now stand, the Army has acquired a reputation among a certain set which deserves correction. Consequently, it is sometimes a matter of difficulty to fill the ranks with the class of men best fitted and most desirable for the position. It need hardly be said that the apprentice battalion, once adopted and recruited solely from youths presenting certificates of good character, will effectually obviate this difficulty. If Congressional districts are ready to furnish ten such lads immediately to serve their country, then no doubt will be allowed to remain that the army is composed of men above the average mental, moral, and physical capacity. While it may be anticipated that a great majority of the young men would retire to civil life at the expiration of their military apprenticeship, still it may be safely calculated that about 25 per cent. of them would remain in the Army through more than one enlistment. Coming, as they will, from our native population, these young soldiers, few in number though they might be, would tend by their presence and influence to Americanize the Army and elevate its general tone. Pray let it be tried. There are more than enough vacancies now in the Army for all the apprentices needed for this experiment.

The Gordon Boys' Home, at West End, Cobham, England, gives a quite recent illustration of the practical workings of a battalion of boys, about 60 per cent. of whom enter the army.

An act of Congress is not really necessary for the organization of apprentice battalions, since the law already authorizes the enlistment of minors. But an act of Congress authorizing apprentice battalions over and above the present small force of the Army would certainly be desirable. These battalions need not at first be numerous or comprise any large number of boys, but they might be enlarged as experience and practicability admit; and the pay of the apprentices should perhaps be upon a smaller scale than that of the adult soldiers. These details may be settled later. The main idea is to get the plan once into vogue, and then to perfect it as may appear most practicable and feasible.

An indication of what is thought in the Army on this subject will be found in Appendix "A" (the letters on apprentice battalions), and the present status of post schools is indicated by the extracts from the

reports of officers of this department serving in the East and West, which are printed herein under their appropriate heads.

Recruiting. The subject of recruiting has received more than ordinary attention during the past year, and while the experiments have not yet been tried long enough for absolute decisions, it is evident that something better and cheaper than the old system, both of recruiting and of instructing recruits, should be sought till found. The best, perhaps the only wise place to enlist soldiers habitually is at their own home, with the full knowledge of their kith and kin, as must be done in war. Under the modern and civilized methods of recruiting, an army illustrates somewhat the character and qualities of the nation at large. In the first flush of our last war we resorted instinctively to regimental recruiting and localized regiments, which promises the greatest ultimate economy and efficiency as well as the greatest promptness, and this is an essential element in war now.

Our recent system perhaps represents the opposite extreme. And though it may prove very difficult to free ourselves from it, its essential character has been fully illustrated; and the many experienced soldiers now in every legislative and administrative position know how it would have worked to have had every regiment in the last war organized from promiscuous gatherings of unknown men from distant regions, as all our regiments are filled up now.

The connection between our most expensive military crime, desertion, and our old system of recruiting may not need demonstration; it is what might be expected when many men whose parents or former surroundings are unknown, are enlisted in the cities and forced into the most intimate association, so either the good or bad must go.

The duties of the average soldier in peace may be about as hard as those of the average laboring man. Their physique is most perfect and their endurance and courage are sometimes tested to the utmost even in our times of so-called peace. Soldiering is a trade in which combination is the essential element of success. All recognize how superior a properly disciplined company of one or two hundred soldiers is, for the purposes for which it was organized, to the same number of unorganized men of equal qualities. So it is wise to have them assimilate and become good comrades quickly, and not make the elements as discordant as possible. The company organization is the home of the soldier and is the proper place to train as well as fight him. He may find fighting and training often elsewhere, but there it should be the regular business.

Unorganized Soldiers. Organization is one of the first distinctions of soldiers. So it is not surprising that during the past year those found at all unsatisfactory in affairs affecting the personnel were men without permanent legal organization, such as the prisoners at several places, the recruits at a depot, and the so-called "artillery" detachment recently abolished by the act of June 20, 1890. The contrast is illustrated perhaps by the difference between the content and comfort of the men confined in the prison at Fort Leavenworth, Kans., and elsewhere. The prison is legally established and most carefully supervised, with a large garden and with thousands of dollars secured in the mess fund, and the men are employed at instructive work, with comforts so marked as to have become proverbial, and the command of it is recognized as a desirable detail; while at Alcatraz, the prisoners breathed vitiated air when locked up, did their work in most uncomfortable gangs, and were limited to the Army ration, which was found so inadequate that every local authority successively reported

they were habitually hungry, and, with the certainty of punishment, some of the prisoners at last struck work rather than work so insufficiently fed. This has received remedial action.

Desertions. There are always a good many persons who fancy desertions can be limited by imposing more severe punishment on the few that are caught, disregarding such continuous experiments as this, where practically the punishment has been decidedly more severe on the Pacific coast, and yet the per centum of desertion has been comparatively high.

The best remedy for desertion is to make it impracticable and undesirable. Proper and well-known recruits will not desire to desert under ordinary circumstances. An undesirable recruit can be discharged as he would be in any other employment. But should the service be given vicious men and vicious horses we would expect expensive trouble with them. Desertion is said to waste something like a couple of hundred thousand dollars per annum, or \$20,000,000 in the past hundred years. No one believes it is a good thing. The problem is how to fill the Army from the first with well known and desirable recruits, without the weeding-out process of desertions and discharge.

Our Army deserves to be held in high esteem, and the regiments are held in kindly esteem and admiration where they are known, especially by the classes of the people who have a taste for military affairs. And two methods to acquaint our people always with the commendable character of our veteran soldiers have been proposed; one, to localize certain regiments under the very best recruiting officers, so in the course of years the character of the recruits will necessarily be known at their own homes when they start to enlist and within the regiments when they arrive and no incorrigibles can be admitted; and the other is to establish a battalion of apprentices raised so as to represent the whole country and assigned after thorough training to certain designated permanent organizations until the type dominates and is thoroughly established in the service. Both plans have some merits and may meet great discouragements. But we all see that a regiment of trained *élèves* from such an apprentice system will have qualities any army should desire. And regiments of such a thoroughly trained *personnel* would be of inestimable advantage as models to our National Guard. Such well selected and thoroughly trained recruits are of special importance in the mounted service; and perhaps most necessary in the light artillery, which has suffered particularly from former methods of recruiting and assignment. Surely our people can be brought to know and appreciate the Army from its best representatives as generally as such evil spirits as Dell Wild are known and talked of now.

PUBLIC ANIMALS.

This subject having been specially referred to Lient. Col. H. W. Lawton, he reports as follows:

The opinions of officers differ so widely as to the description of a desirable cavalry horse and the best method of securing them, that it is impossible to state the views of a majority. The prejudice against the half-breed, or Pacific States, horse is very strong. It is held that regardless of the amount of breaking (training) that may be given them, there is still an inbred strain of viciousness that will crop out from time to time, which renders them unsafe and unreliable. While the horses from the Middle States, or Mississippi Valley, are more satisfactory as to temper, there is a great complaint of heavy-limbed, straight-shouldered clumsiness, and in most horses of over six and seven years stiffness or some other imperfection is soon developed. The idea

is that in the Eastern and Middle States the demand for saddle-horses is decreasing, and that for draft horses increasing; therefore breeders, conforming to the demands, are using the heavy Norman stallion, producing a tractable animal, but a conformation which is unsuitable for saddle purposes, and further, that colts are now put to work at three years of age instead of five as formerly, and that, having been used for draft purposes for three or four years during the period of development, a change to the saddle can not then be satisfactorily or successfully made. The animal develops unsoundness, or if he escapes this, is a clumsy brute at best. The Western horse is more satisfactory as to breeding, but as his training does not begin until he is four or five years old, his wild and vicious habits are too firmly fixed to be cured. That the breeding of saddle-horses is yearly decreasing there is no doubt, and that the picking up here and there of a horse that can be made to serve the immediate purposes of the service does not sufficiently encourage this industry to assure even the preservation of the stock. While we may continue to supply limited demands for cavalry horses in the future in this makeshift way of the present, a time will come when the service will require a larger number of this class of horses, and the street-cars, hacks, and farm wagons will have to be robbed to supply the troopers. Various methods have been suggested to insure to the service a suitably bred, properly trained horse. Among them, the establishment of breeding farms. This would seem hardly necessary or possible in a country like ours, where horse-breeding is one of the leading industries, and where more and better horses are bred than in any other country in the world. I believe that to establish one or more permanent depots at suitable points where it may be known that a certain number of suitably bred colts will be annually purchased by the United States, and where these colts shall be matured, broken, and trained, will encourage the breeding in their vicinity a sufficient number of animals at reasonable prices. The advantages of such a plan to the service is apparent. The trooper will no longer have to depend upon the awkward plow-horse or unbroken colt, but may be supplied with a trained saddle-horse. Such a plan, well conducted, under the direction of suitable men, should not only give the cavalry a superior horse, but prove an economical reform.

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MILITARY SCIENCE AT COLLEGES.

The following extracts from the reports of the inspection of the work of army officers at colleges and the tabulated statement of facts in Appendix B may indicate the current of thought and work of the army officers having the closest connection with the institutions :

[Virginia Agricultural and Mechanical College at Blacksburg, Va., Second Lieut. John J. Knight, Third Cavalry, professor of military science and tactics. Inspected November 11 and 12, 1889, by Lieut. Col. H. Clay Wood, assistant adjutant-general.]

Lieutenant Knight reports the zeal and acquisition of knowledge of the school satisfactory. He also reports opposition on the part of individual members of the faculty to the strict and rigid rules, so essential in a thorough military organization; that, with the present condition of affairs, the greatest improvement necessary is better arms, ammunition, field artillery, and, as a sequence, target practice. This could all be supplied by the United States Government upon the execution of the requisite bond. Besides this, a set of general rules and regulations governing officers on such duty, a clear definition of the duties of such officers. He reports a general opinion prevails among the college authorities that more benefit would be reaped and a better result shown should the detail of army officers be made for four instead of three years.

[Bingham School, North Carolina, Second Lieut. James B. Hughes, Tenth Cavalry, professor of military science and tactics. Inspected November 14 and 15, 1889, by Lieut. Col. H. Clay Wood, assistant adjutant-general.]

The Department in pursuance of law, provides for this school an army officer, presumably competent, as professor of military science and tactics, and supplies ordnance and ordnance stores in ample quantity. This officer is paid by the United States a salary equal, it is believed, to the average salary paid to college professors. These acts are gratuitous. For this gratuity I believe these institutions of learning should in equity render some adequate remuneration. I think theoretical military instruction should be required at this school, and that at least five hours a week should be allotted by the superintendent for the purpose, and that the little leaven of theory thus disseminated through the "one hundred and seventy" cadets would be abundantly productive of beneficial results.

Pennsylvania Military Academy, Chester, Pa., Second Lieut. Beverly W. Dunn, Third Artillery. Inspected June 2, 1890, by Maj. P. D. Vroom, inspector-general.]

The president suggests that the detail of the military professor be made for four years instead of three, as at present. Each officer would then be enabled to carry one class through the entire four years' course. I agree with Colonel Hyatt that an extension of the time of detail is desirable. The military professor suggests that when an officer is detailed for college duty he should be sent to the institution at least a month before the old officer is relieved. He also suggests that a suitable textbook for the military course at colleges be prepared.

[Maryland Agricultural College, Prince George's County, Maryland, Second Lieut. A. R. Smith, Tenth Infantry. Inspected June 9, 1890, by Maj. P. D. Vroom, inspector-general.]

The military professor suggests that the relation of an officer on college duty to the general discipline of the institution should be clearly defined.

Remarks of president of college: "This suggestion is agreed to if the words 'by the college authorities' be added. And the duties of the officer in his relation to general discipline are clearly defined at this college; he executes the orders of the president and exercises such authority as is delegated to him."

[Michigan Military Academy, Orchard Lake, Mich., Second Lieut. F. T. Van Liew, Second Infantry. Inspected November 21, 1889, by Col. R. P. Hughes, inspector-general.]

The only improvement I can see in which the Government might still further aid the school might be in lending to it a sufficient amount of tentage, once per annum, to allow of its going into camp for a few weeks to teach the youngsters something about field life and work.

[Allegheny College, Meadville, Pa., Lieut. J. F. Krebs, Twenty-second Infantry. Inspected May 12, 1890, by Col. R. P. Hughes, inspector-general.]

I do not think any institution should be given an officer that will not make the taking of the military course compulsory on at least a portion of the student body.

Remarks of president of college: "In reference to the indorsement thereon, I have the honor to report that this college will conform to all positive requirements of the War Department with scrupulous care. If, at any time in the future, those requirements should be such as we can not conform to, we will then promptly resign the detail."

[Cathedral School of St. Paul, Garden City, L. I., First Lieut. M. F. Waltz, Twelfth Infantry. Inspected May 26, 1890, by Col. R. P. Hughes, inspector-general.]

"An officer should stay where his work is unless the circumstances are very exceptional."

Remarks of head master of school: "This school has always placed quarters at the disposal of the professor of military science and tactics, and has also paid him \$45.83 a month for house rent for the accommodation of his family. This payment was in addition to the \$500 referred to in the inspector-general's report."

[St. John's College, Fordham, N. H., Second Lieut. H. C. Squiers, Seventh Cavalry. Inspected May 20, 1890, by Col. R. P. Hughes, inspector-general.]

From a personal and close observation of different systems I have no hesitation in stating that the introduction of the military organization and system into the daily routine of a college gives results in the military department that can not be obtained in any other way.

[Agricultural and Mechanical College of Mississippi, Starkville, Miss., First Lieut. John V. White, First Artillery. Inspected January 17, 1890, by Col. E. M. Hoyt, inspector-general.]

Lieutenant White thought it would be well if the Government could furnish a guard report book, consolidated morning report book, and such blanks as are considered most important for the students to be familiar with.

"The military course at this college is given the same weight as other subjects in graduating class standing, but the time in this course is limited. The students are required to pass an examination on the subjects studied and make an average of sixty (60) out of a possible one hundred (100) points. In this connection Lieutenant White recommends that one course of instruction be prescribed to insure uniformity, as different officers do not attach equal weight to the same subject."

[University of Illinois, Champaign, Ill. First Lieut. C. B. Hoppin, Second Cavalry. Inspected May 22, 1890, by Col. E. M. Heyl, inspector-general.]

Lieutenant Hoppin recommends that the officer on duty at colleges should not be relieved until the one sent to relieve him has arrived and been present with the battalion for at least two weeks, so as to carry on the work as smoothly as possible and to relieve the new officer of the embarrassment and the institution of the uncertainty consequent upon his entry upon routine work, for which no rules are laid down as an index of *how* and *why* it is carried on as it is.

[State University of Nevada, Reno, Nev. First Lieut. A. C. Ducat, jr., Twenty-fourth Infantry. Inspected June 2, 1890, by Lieut. Col. G. H. Burton, inspector-general.]

I venture to suggest that the present method of making details, viz, only on the application of the faculty, is faulty in this, that the faculty in the nature of their isolation from the Army can rarely ever know the officer whom they recommend, and in their ignorance depend upon politicians for information and support that should come only from the War Department and the General of the Army. Furthermore, the loss to the college sustained by an ill-selected representative is coupled with a demoralization to the service induced by invitation to use all kinds of influence to obtain details which merit only should determine; and hence the incentives to study and labor for preferment are lost in the general scramble which is won oftener by importunities and wire-pulling than by recognized merit. In my judgment every institution entitled to an officer as professor of military science and tactics would prefer the War Department to select for it the best possible, and rest their cause on the War Department's known judgment and knowledge of the officer for the place he has to fill.

[University of the State of California, Berkeley, Cal. First Lieut. G. E. Harrison, Second Artillery. Inspected June 4, 1890, by Lieut. Col. G. H. Burton, inspector-general.]

It was a happy thought in the War Department to direct an inspector to visit the colleges each year. They themselves appreciate the value of such supervision as adding dignity and character to the Department, as well as for its diffusion of a sympathetic interest in the profession of arms, which links them as kindred in feeling, and almost a part in fact, of the Government in its Department of War. The cadets feel a pride in the paternal care exercised over them by the Secretary of War, as exhibited through these inspections, and evince an intense desire to acquit themselves with credit before the Secretary's representative.

[Cornell College, Mount Vernon, Iowa. First Lieut. Walter Howe, Fourth Artillery, professor of military science and tactics. Inspected May 21, 1890, by Maj. J. P. Sanger, inspector-general.]

Attention is invited to the importance of providing this college with field artillery in which the cadets will no doubt take much interest, and from which they will derive much benefit. It is suggested that if practicable only the brass 6-pounders or 3-inch rifled gun be furnished, as the 12-pounders are too heavy for boys to use.

[West Virginia University (State Agricultural and Mechanical College), Morgantown, W. Va. Second Lieut. Edward S. Avis, Fifth Infantry. Inspected June 6, 1890, by Lieut. Col. H. Clay Wood, assistant adjutant-general.]

Of course there are drills, and it is stated there are lectures, but an examination of the catalogue does not disclose, in the schedule of hours allotted to the different studies, that any time has been allotted to the military department for theoretical instruction, or for that matter, even for drills.

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REPORT OF THE SUPERINTENDENT OF THE U. S. MILITARY ACADEMY.

U. S. MILITARY ACADEMY.

West Point, N. Y., September 8, 1890.

GENERAL: As superintendent of the U. S. Military Academy I have the honor to submit the following report for the year ending August 31, 1890:

The number of officers and instructors stationed at this post on September 1, 1890, was as follows: Eight professors, fifty-two commissioned officers, including one surgeon and one assistant surgeon, one acting assistant surgeon, one sword-master, and one teacher of music.

THE CORPS OF CADETS.

Section 1315, Revised Statutes, provides that the Corps of Cadets shall consist of one from each Congressional district, one from each Territory, one from the District of Columbia, and ten at large, making 346 in all.

This institution is perfectly capable of accommodating that number, but owing to the fact that many candidates appear before the Academic Board unprepared for the examination, and that cadets are discharged from time to time during the year for various causes, the battalion seldom exceeds three hundred in number.

On September 1, 1889, there were 294 cadets connected with the Military Academy. Since that date the loss has been 8 by resignation, 22 by discharge, 2 by death, and 54 by graduation. The gain has been 81 admitted as new cadets, making a present total of 289 belonging to the Corps of Cadets, 4 of whom were admitted September 1, 1890.

This number includes one cadet from Switzerland and one from Central America, who are receiving instruction at the academy by authority of joint resolutions of Congress.

As stated in previous reports, the candidates entering in September labor under many disadvantages. They have failed to gain the drill and instruction which their more fortunate classmates have acquired during the summer encampment; they are ignorant of the regulations and are new to everything connected with the academy; they must be drilled and disciplined while others are resting, and they immediately begin their academic duties and are obliged to keep up with their class in their studies.

Moreover, the drilling of these new men entails additional duties upon some of the older cadet officers, who must instruct them at hours which really should be devoted to their own studies.

Of the fifty-six candidates who presented themselves August 28, 1889, only sixteen were admitted, and only six of these remained in the class after the June examination in 1890. I attribute this greatly to the fact that the young gentlemen did not get an even start with their class.

On August 27, 1890, twenty candidates presented themselves for examination. Of these only four succeeded in passing, and were admitted to the academy September 1, 1890. These four young gentlemen, in addition to their regular academic duties, must be put through a rigorous course of drill until October 15.

It is hardly necessary to dwell further upon this matter, but it is earnestly urged that, except under extraordinary circumstances, no

further September appointments be made, and that the June candidates may be notified a sufficient time in advance of reporting to permit them to prepare themselves for the examinations in arithmetic, geography, grammar, history of the United States, reading, writing, and orthography.

At the June examination in 1890 twenty-four candidates were pronounced physically disqualified, a large per cent. failing upon their eyesight.

I think candidates should be required, if possible, to report for physical examination to the nearest medical officer of the Army immediately after receiving their letters of appointment, and should they be pronounced physically disqualified, their appointments could at once be revoked and they would be spared further expense and mortification.

Several of those who failed in June, 1890, informed me that they were entirely unaware that there was anything the matter with them until the result of their medical examination was announced.

In case it is not possible to reach a medical officer of the Army, then it would be well for the candidate to appear before a civilian physician, who should be furnished with an exact statement of the method of physical examination as conducted by Army surgeons.

During the past year the condition of the Corps of Cadets, as regards drill, discipline, and instruction, has been excellent. This is shown by the fact that in the first three classes, aggregating one hundred and eighty-four men, but one cadet failed to pass the June examination, while of seventeen pronounced deficient in the fourth class, ten were recommended to be turned back and only seven discharged. I attribute this not only to the care and attention bestowed upon their duties by the distinguished professors and officers in charge of departments and their able assistants, but also to the careful manner in which the preliminary examination is carried on, whereby those not properly prepared are rejected.

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REPORT OF THE ADJUTANT-GENERAL.

WAR DEPARTMENT,
ADJUTANT-GENERAL'S OFFICE,
Washington, October 7, 1890.

SIR: I have the honor to submit the annual report of this office for the year ended September 30, 1890.

MILITARY COLLEGES.

The data in the statement herewith, tabulated from the reports of the officers performing the duties of professor of military science and tactics at the enumerated universities and colleges, give gratifying evidence of the increasing interest manifested by the college authorities in a course of studies and exercises that, in addition to imparting military knowledge, tend so directly to develop obedient submission to authority and manliness of deportment.

The average number of students over fifteen years of age attending these institutions during the past scholastic year was 11,649, of whom 311 attended artillery drills and 5,014 infantry drills. The total num-

ber of pupils reported as having received military instruction during the last quarter of the school year is 6,005.

One of the obstacles, pointed out in former reports, to a thoroughly satisfactory military department (fewness of number of students) is steadily decreasing. While, in the last annual report on this subject, at twelve institutions the average attendance of students of suitable age was less than 100, and at five of them it fell below 50, it is gratifying to note that only nine colleges have less than 100, and but three where the average attendance falls below 50.

The aptitude of students for military studies and exercises is very good and, in the great majority of cases, is stimulated by the active interest manifested by the respective faculty of the universities and colleges; but there still remains a few instances where the latter exhibit only moderate or small interest in the military department, evidencing on their part a lack of appreciation of the advantages offered them by the law authorizing the detail of officers of the Army as military professors.

The best results will not be obtained until each university or college favored with an army detail makes military drill and instruction compulsory upon all male students of proper age who are physically able and, in addition, provides adequate facilities for in-door drills during the winter months.

It is suggested that officers acting as military professors be not relieved from duty earlier than two weeks after the arrival of their successors, in order to relieve the latter from the embarrassing uncertainty consequent on their entry upon routine work for which no rules are laid down.

Universities and colleges.	Average number of students.			Attendance at—		Total number that received military instruction during the last quarter.	Attitude of pupils.	Students.	Faculty.
	Over 15 years of age.	Under 15 years of age.	Total.	Artillery drills.	Infantry drills.				
Agricultural and Mechanical College, Auburn, Ala.	223	7	230	67	172	192	Fine.....	Very satisfactory....	Fair.
Arkansas Industrial University, Fayetteville.....	216	13	229	144	144	144	Good.....	Good.....	Good.
University of California, Berkeley.....	270		270	192	192	235	Very good.....	do.....	Fair.
Agricultural College of Colorado, Fort Collins.....	41	2	43	37	37	47	Good.....	do.....	Excellent.
Sheldon Scientific School of Yale University, New Haven, Conn.	355		355	Not given	Not given		Superior.....	Highly satisfactory....	Decidedly good.
Delaware College, Newark.....	80	23	113	18	68	77	Very good.....	Very good.....	Very good.
North Georgia Agricultural College, Dahlonega.....	94	13	111	16	73	79	Fair.....	Very fair.....	Fair.
University of Illinois, Champaign.....	330		330	20	221		Good.....	do.....	Good.
Knox College, Galesburg, Ill.....	200	10	210	39	39	51	Fair.....	do.....	Moderate.
Purdue University, Lafayette, Ind.....	280	8	288	14	41	79	Very good.....	Quite good.....	By the majority, good.
Cornell College, Mount Vernon, Iowa.....	405	1	406	191	211	211	Excellent.....	Above the average....	Fair and increasing.
State University of Iowa, Iowa City.....	146		146	16	98	130	do.....	Satisfactory.....	Satisfactory.
Kansas State Agricultural College, Manhattan.....	236		236	15	105	130	Good.....	Good.....	Fair.
Agricultural and Mechanical College of Kentucky, Lexington.....	178	2	180	18	116	180	do.....	do.....	Fairly good.
Louisiana State University and Agricultural and Mechanical College, Baton Rouge.....	108		108		95	110	Fair.....	Fair.....	Good.
Maine State College of Agriculture and the Mechanical Arts, Orono.....	111		111		88	200	Good.....	Excellent.....	Excellent.
Mayland Agricultural College, Prince George's County.....	128	4	132		24	34	do.....	Good.....	Little.
St. John's College, Annapolis, Md.....	87	26	113		105	105	Considerable.....	Satisfactory.....	Satisfactory.
Massachusetts Agricultural College, Amherst.....	50		50	22	67	96	Good.....	Good.....	Excellent.
Michigan Agricultural College, East Lansing.....	235		235	11	150	192	Excellent.....	do.....	Good.
Michigan Military College, Orchard Lake.....	151	6	157	138	158	160	do.....	Excellent.....	Excellent.
University of Minnesota, Minneapolis.....	700		700	11	65	60	Good.....	Fair.....	Very small.
Agricultural and Mechanical College of Mississippi, near Starkville.....	260		260	14	92	214	do.....	Good.....	Good.
Missouri Military School, Columbia.....	450		450	13	70	120	do.....	do.....	Do.
University of Nebraska, Lincoln.....	180	7	187	10	110	118	do.....	Very great.....	Not as great as it should be.
Nevada State University, Reno.....	100		100		29	32	do.....	Great.....	Great.
Rutgers College, New Brunswick, N. J.....	175		175		59	72	do.....	Good and increasing.	Good.
Catholic School of St. Paul, Garden City, N. Y.....	67	28	95		102	66	do.....	Fair.....	Fair.
Cornell University, Ithaca, N. Y.....	123		123	20	322	401	do.....	Good.....	Do.

Tabulated statement from reports of professors of military science and tactics, etc.—Continued.

Universities and colleges.	Average number of students.			Total.	Attendance at—		Total number that received military instruction during the last quarter.	Attitude of pupils.	Students.	Faculty.
	Over 15 years of age.	Under 15 years of age.	Artillery drill.		Infantry drill.					
St. John's College, Fordham, N. Y.	159	73	202	97	133	197	Fair	Fair	Great.	
Bingham School, Orange County, N. C.	128	11	130	133	40	137	do	do	Good.	
University of North Dakota, Grand Forks	41	1	42	40	40	40	do	do	do	
Ohio Normal University, Ada	720	340	720	16	139	239	do	do	Very good.	
Ohio State University, Columbus	340	16	360	16	160	241	do	do	Good.	
University of Wisconsin, Madison	273	15	273	15	136	192	do	do	Fair.	
University of Wooster, Wooster, Ohio	170	18	170	18	82	44	do	do	Average.	
Allegheny College, Meadville, Pa.	138	7	145	40	141	148	Average	Below average	Good.	
Forney Boyds Military Academy, Chester	160	4	164	30	53	123	do	do	Fair.	
South Carolina State College, Center County	123	30	153	30	104	123	do	do	Very great.	
South Carolina Military Academy, Charleston	150	39	189	39	86	130	Satisfactory	Active	Considerable.	
South Dakota Agricultural College, Brookings	177	16	193	16	163	46	do	do	Fair.	
University of the South, Swann, Tenn.	153	153	153	122	153	153	do	do	Favorable.	
University of Tennessee, Knoxville	178	10	188	22	178	177	do	do	Fair.	
Agricultural and Mechanical College of Texas, College Station	164	48	212	48	48	54	do	do	do	
Norwich University, Northfield, Vt.	125	11	136	11	63	79	do	do	Fair.	
University of Vermont, Burlington	130	104	234	104	135	135	do	do	Good.	
Virginia Agricultural and Mechanical College, Blacksburg	185	1	186	37	90	81	do	do	do	
West Virginia University, Morgantown	675	675	675	152	152	162	do	do	Fair.	
University of Wisconsin, Madison	800	800	800	23	136	170	do	do	Satisfactory.	
De Pauw University, Greencastle, Ind.							do	do	Good.	

Excluding the Confederate Archives Division, which furnishes on call of the President, Congress, the various bureaus of the Executive Departments, and the Court of Claims information concerning the loyalty of the numerous claimants for property taken by the United States during the late war, etc., the clerical force of this office is actively and usefully employed on work pertaining to the administration of affairs affecting the Regular Army or peace establishment, including the recruiting service. In addition to this, the Regular Army Rolls Division is largely employed in making reports to the Pension and other offices, and also the Second Auditor of the Treasury, to enable the latter to settle amounts due the Soldiers' Home arising from forfeitures of pay, etc., by sentence of courts-martial or by desertion. The work of this division in this matter is exhibited in the following table :

	On hand July 1, 1890.	Received.	Finished.	On hand October 1, 1890.
Commissioner of Pensions.....	24	7,502	7,526	.....
Second Auditor.....	1	26,392	26,393	.....
Third and Fourth Auditors.....		11	11	.....
Second Comptroller.....	1	30	31	.....
General Land Office.....		81	81	.....
Paymaster-General.....	5	355	360	.....
Quartermaster-General.....		37	37	.....
Commissary-General of Subsistence.....		59	59	.....
Total.....	31	34,467	34,498	.....

I take pleasure, in closing this report, to record my appreciation of the general intelligence, zeal, and efficiency of the clerks of the Adjutant-General's Office.

Respectfully submitted.

CHAUNCEY MCKEEVER,
Acting Adjutant-General.

HON. REDFIELD PROCTOR,
Secretary of War.

REPORTS OF INSPECTIONS OF MILITARY DEPARTMENTS OF COLLEGES, ETC.

ALABAMA AGRICULTURAL AND MECHANICAL COLLEGE.

HEADQUARTERS DIVISION OF THE MISSOURI,
INSPECTOR-GENERAL'S OFFICE,
Chicago, Ill., January 25, 1890.

The INSPECTOR-GENERAL, U. S. ARMY,
Washington, D. C.

SIR : I have the honor to submit the following report of my inspection of the military department at the Agricultural and Mechanical College of Alabama, Auburn, Ala., made January 20, in accordance with instructions from your office dated September 27, 1886.

Lieut. J. B. McDonald, Tenth Cavalry, is still on duty at this college as professor of military sciences and tactics, in pursuance to Special Orders No. 190, Adjutant-General's Office, 1884; he is acting commandant of cadets and has charge of the demerit record of the students, drills and instructs the companies and battalion. He received \$300 per year from the college funds, but is employed only on work in the military department. Being a member of the faculty, he attends all its meetings.

Ab 90—12

This college has the capacity to teach 300 or more students annually. During the present year 334 have matriculated up to date, all males. Of these 233 are organized into a battalion of four companies, embracing the following classes: Seniors, 29; juniors, 29; sophomores, 56; freshmen, 64; and subfreshmen, 34. Their age is from 13 to 23 years—12 years being about the average, only seven being under 15 years of age. They are drilled in squad, company, battalion, and skirmish drills, light artillery drill, and target firing with cadet rifles. The battalion is armed with two 3-inch rifles with carriages and limbers; the pole of one of the limbers is still broken (reported last year), it was received in unserviceable condition. One hundred and fifty Springfield cadet rifles and 150 sets infantry equipments are in good condition and stored in brick store-house near college building. Received last year from Rock Island Arsenal 100 blank cartridges and 300 friction primers for 3-inch rifles; 6,000 ball and 5,000 blank cartridges for cadet rifles, caliber .45, all in good condition.

Military drill is obligatory upon all classes except those physically disqualified, and privates of the senior class may be excused from drill by the faculty when they have attained a proper proficiency therein. During the first three months of the college year the cadets are drilled twice a week in company drill and once a week in battalion drill. The next six months they have two battalion and one company drill per week; in May the corps drill daily, except Sunday. Dress parade generally takes place after drills; reviews, inspections, and guard mounts often enough to instruct them tolerably well in these exercises; light artillery-drills about twenty to forty during the year. The students also march to church, recitations, etc. The theoretical instruction given is by a course of lectures, in the spring of the year, on martial and military law, grand tactics and strategy, illustrated by different campaigns, field of operation, etc., and weekly recitations in tactics by the senior and junior classes. This, Lieutenant McDonald states, usually makes the cadets quite proficient in the ordinary routine of military duties and prepares a well-drilled battalion by June, the month of the commencement.

The facilities for indoor drill is a long hall in basement of new academic building; have also a drill-ground large enough to maneuver the battalion upon.

All regular studies, including the military course, are rated alike for graduation.

The interest in the military course and discipline of students is good and growing better, but as none of the students live at the college it is not possible to enforce strict military discipline. The students as a rule come to the college for a collegiate and scientific education, and being usually very deficient in these departments can not afford to devote more time than is allowed to the military education. But with the time allowed and the constant changes in the personnel of the classes this department is doing about as well as could be desired or expected under the circumstances. This institution seems to fulfill the requirements of the law (Rev. Stats. 125) to the best of its opportunities. The library of this college since it was burned two years ago has not been replaced.

The battalion and company drills were very satisfactory; a great improvement since last inspection. The arms and accoutrements were in good condition and well cared for.

Respectfully submitted,

Your obedient servant,

E. M. HEYL,
Colonel, Inspector-General.

REPORT OF THE PAYMASTER-GENERAL.

WAR DEPARTMENT,
PAYMASTER-GENERAL'S OFFICE,
Washington, D. C., October 10, 1890.

SIR: I have the honor to submit the following report of the transactions of the Pay Department of the Army during the past fiscal year, and to offer some suggestions thought appropriate to this branch of the public service:

From the statements appended is drawn an exhibit of receipts and expenditures during the fiscal year which ended June 30, 1890, as follows:

REPORT OF THE SECRETARY OF WAR.

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Balance charged to paymasters July 1, 1880	\$1,291,540.86
Amount received from—	
Treasury during fiscal year.....	13,947,949.83
Soldiers' deposits	395,129.82
Paymasters' collections.....	288,805.54
Total to be accounted for.....	15,923,424.87

Accounted for as follows:

Expended:	
Pay of Army.....	\$13,548,454.34
Pay of Military Academy.....	206,317.60
Pay of Signal Service.....	46,543.48
Pay of volunteers (on Treasury certificates)	624,010.75
Total expended	14,425,326.17
Surplus funds deposited to credit U. S. Treasurer.....	45,233.19
Paymasters' collections deposited to credit U. S. Treasurer	288,805.54
Balance charged to paymasters June 30, 1890.....	1,164,059.97

Total accounted for..... 15,923,424.87

A comparison of the expenditures of the last fiscal year with those of the preceding year shows a net decrease of \$361,294.74:

Decrease in expenditures to the Signal Corps.....	\$140,352.02
Decrease in expenditures to the Volunteers	599,641.06
Total decrease	739,993.08
Increase in expenditures to the Army	378,115.84
Increase in expenditures to the Military Academy.....	552.50
Total increase	378,668.34
Net decrease.....	361,294.74

Since assuming charge of this office, in March last, it has been very gratifying to note the efficiency, industry, and commendable zeal which have characterized the service of the several clerks in the performance of the duties allotted to them.

Very respectfully,

WM. SMITH,
Paymaster-General, U. S. A.

The SECRETARY OF WAR.

REPORT OF PUBLICATION OF WAR RECORDS.

WAR DEPARTMENT WAR RECORDS OFFICE,

Washington, October 8, 1890.

SIR: The board to whom, under your direction, the publication of the Official Records of the Union and Confederate Armies has been entrusted, respectfully submits the following report of its operations during the fiscal year ending June 30, 1890.

On July 1, 1889, the state of the work was as follows: Thirty-five books had been published in previous years, and fourteen books had been stereotyped, of which were indexed and ready for publication. The manuscript of ten volumes was also on hand in various stages of preparation.

The act of March 2, 1889, which went into effect at the beginning of the fiscal year, changed materials the existing methods of publication and provided that the work should be carried on in the future by a Board of Publication, composed of three members, to be appointed by the Secretary of War. Two of the members were to be civilian experts and one an army officer. The statute also provided that the publication was to be completed in five years, and the sum of \$100,000 was set apart for the operations of the board during the fiscal year.

Under the authority conferred by the act, Maj. George B. Davis, of the Judge-Advocate-General's Department, was selected on July 1 as the military member. On July 16 Mr. Leslie J. Perry, and on July 22 Mr. Joseph W. Kirkley were appointed by the Secretary of War as the civilian experts, thus completing the composition of the Board of Publication.

As the chief purpose of the act of March 2, 1889, was to expedite the publication of the work, it was determined to devote a large part of the appropriation for the year to the printing and distribution of volumes already in type. With this end in view, ten books were published and distributed, containing the accounts of the Chancellorsville and Gettysburg campaigns and the important sieges of Vicksburg and Port Hudson. The other departments of the work, however, were not neglected, and the force employed in stereotyping, indexing, and compilation was kept steadily at work during the entire fiscal year. As a result, seven books were stereotyped, carrying the official accounts to the end of 1863, and twelve books were indexed, of which eleven were practically ready for publication at the close of the fiscal year.

The compilation of the second series, relating to prisoners of war, and the volumes of the first series, relating to the operations of the year 1864, were carried forward as rapidly as possible by the limited force which was available for that purpose. The records and files of the War Department and other original sources of information have been examined and consulted, and no pains have been spared which would contribute in the slightest degree to accuracy and completeness in the preparation of the volumes for publication.

Respectfully submitted.

GEORGE B. DAVIS,

Major and Judge-Advocate, U. S. Army, Member.

LESLIE J. PERRY,

Member.

J. W. KIRKLEY,

Member.

THE SECRETARY OF WAR.

REPORT OF THE BOARD OF VISITORS TO THE UNITED STATES MILITARY ACADEMY.

To the Secretary of War, the President of the Senate, and the Speaker of the House of Representatives :

The Board of Visitors to the United States Military Academy at West Point respectfully submit the following report:

The Board was appointed in accordance with the provisions of the Revised Statutes of the United States, sections 1327, 1328, and 1329. These provide that every year seven persons shall be appointed by the President, and two Senators and three members of the House of Representatives shall be designated as visitors by the Vice President of the United States or the President *pro tempore* of the Senate and the Speaker of the House respectively, at the session of Congress next preceding the annual examinations. The statutes further provide that it shall be the duty of this Board of Visitors to inquire into the actual state of the discipline, instruction, police administration, fiscal affairs, and other concerns of the Academy.

NAMES OF THE BOARD OF VISITORS.

In accordance with the provisions of the law, the following gentlemen were appointed and requested to convene at the Military Academy on June 2, 1890:

APPOINTED BY THE PRESIDENT OF THE UNITED STATES.

1. Col. Francis J. Crilly.....Philadelphia, Pa.
2. Col. Lewis M. Dayton.....Cincinnati, Ohio.
3. General Edward Burd Grubb.....Edgewater Park, N. J.
4. Rev. Edward Everett Hale, D. D.....Boston, Mass.
5. Hon. Cornelius C. Jadwin.....Honesdale, Pa.
6. Mr. Hugh McMillan.....Detroit, Mich.
7. Col. Scott Shipp.....Lexington, Va.

APPOINTED BY THE PRESIDENT OF THE SENATE.

8. Hon. Joseph R. Hawley.....Hartford, Conn.
9. Hon. George Gray.....Wilmington, Del.

APPOINTED BY THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

10. Hon. Byron M. Catchoon.....Manistee, Mich.
11. Hon. Joseph McKenna.....Suisun, Cal.
12. Hon. Amos J. Cummings.....New York, N. Y.

ORGANIZATION OF THE BOARD.

The Board organized on June 2 by unanimously electing the Hon. Joseph R. Hawley president, General Edward Burd Grubb vice-president, and the Hon. Amos J. Cummings secretary.

ORDER OF EXAMINATIONS AND EXERCISES.

The Board were informed that the following order of examinations and military exercises had been arranged by the officers of the Academy:

Orders No. 80.]

HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., May 15, 1890.

I. The annual examination will begin on Monday, the 2d proximo, and continue daily, Sundays excepted, from 9 o'clock a. m. till 1 o'clock p. m., and from 2.30 o'clock p. m. till 4.30 o'clock p. m., until finished.

II. The Academic Board will be divided into two committees.

The first committee will be composed of—

- The Professor of Natural and Experimental Philosophy,
- The Professor of Mathematics,
- The Professor of Law,
- The Professor of Civil and Military Engineering, and
- The Instructor of Practical Military Engineering.

The second committee will be composed of—

- The Professor of Modern Languages,
- The Professor of Drawing,
- The Professor of Chemistry, Mineralogy, and Geology,
- The Professor of History, Geography, and Ethics,
- The Commandant of Cadets, and
- The Instructor of Ordnance and Gunnery.

The first committee will sit in the Library and examine orally—

- (1) The first class in engineering.
- (2) The third class in mathematics.
- (3) The second class in natural and experimental philosophy.
- (4) The first class in law.

And by written examination—

The fourth class in mathematics at 8 a. m., June 3.

The second committee will sit in Room No. 1, Academic building, and examine orally—

- (1) The second class in chemistry, mineralogy, and geology.
- (2) The fourth class in French.
- (3) The first class in ordnance and gunnery.
- (4) The first class in Spanish.
- (5) The third class in French.

And by written examination—

The fourth class in French at 8 a. m., June 2.

The first class in Spanish at 8 a. m., June 4.

The fourth class in English at 8 a. m., June 5.

The third class in French at 8 a. m., June 6.

And by inspection of marks and drawings—

The second and third classes in drawing.

In all the classes the oral examinations will begin with the lowest sections, and the examinations will be so conducted as not to interfere with the usual hours for meals of cadets.

All written examinations will be conducted in Room 23, Academic building.

The superintendent will preside in either committee in which he may be present.

III. As each committee shall complete its labors of examination, its presiding officer will report the fact to these headquarters.

Either committee may, in its discretion, extend its labors not to exceed one hour each day, provided this does not interfere with any of the military exercises directed in Paragraph VI of this order.

IV. First Lieut. Samuel D. Freeman, Tenth Cavalry, and Second Lieut. Benjamin Alford, Twentieth Infantry, are appointed the secretaries of the first and second committees respectively. The record of each committee will be so kept as to show clearly the length of time occupied in examination by each department of instruction.

At the close of each day's proceedings, the secretaries will report to the adjutant of the Academy the progress of the examination, and they will transmit to the secretary of the Academic Board the records of the proceedings of the committees as soon as they are completed.

V. The instructors will report daily to the heads of their respective departments, and keep themselves informed as to the times when their services will be required.

VI. The following military exercises will take place during the examination:

Exercise.	Subject.	Date.
Infantry	Review	June 2
	School of the battalion	June 4
Artillery	Battalion skirmish drill	June 9
	Mortar battery drill	June 9
	Light battery drill	June 10
Cavalry	Sea-coast battery drill	June 6
	School of the company and battalion	June 8
Practical military engineering	School of the soldier mounted	June 6
	Spear bridge building	June 10
	Pontoon bridge building	June 7
Small arms	Military signaling	June 11
	Use of the sword and bayonet, and military gymnastics.	June 11

This order of exercises may be changed on account of the weather, or for other causes.

VII. The members of the First Class will be graduated June 12, 1890.

By order of Colonel Wilson.

W. C. BROWN,

First Lieutenant First Cavalry, Adjutant.

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WORKING COMMITTEES APPOINTED.

At the third session, on June 3, the Board appointed the following committees:

1. *On buildings, grounds, and police administration.*—Hon. Byron M. Cutcheon, chairman; Hon. George Gray, Hon. Amos J. Cummings, Mr. Hugh McMillan, and Hon. Joseph McKenna.

2. *On discipline and instruction.*—General Edward Burd Grubb, chairman; Col. Lewis M. Dayton, Rev. Edward Everett Hale, D. D., and Col. Scott Ship.

3. *On ordnance, armament, and equipment.*—Col. Scott Ship, chairman; Hon. Joseph R. Hawley, Col. Lewis M. Dayton, and General Edward Burd Grubb.

4. *On cadet supply department and expenditures.*—Col. Francis J. Crilly, chairman; Mr. Hugh McMillan, and Hon. Amos J. Cummings.

5. *On fiscal affairs of the Academy.*—Hon. George Gray, chairman; Hon. Cornelius C. Jadwyn, Hon. Joseph R. Hawley, and Col. Francis J. Crilly.

6. *On appointments, examinations, and miscellaneous business.*—Rev. Edward Everett Hale, D. D., chairman; Hon. Cornelius C. Jadwyn, Hon. Joseph McKenna, and Hon. Byron M. Cutcheon.

By order of the Board an official list of the committees was sent to the Superintendent of the Academy. The Rev. Edward Everett Hale, D. D., was selected to deliver the address to the graduating class of cadets on June 12.

* * * * *

EXAMINATIONS AND APPOINTMENTS.

The statute regulating the number of cadets was passed on March 1, 1843. The section relating to this subject is in the following words:

The corps of cadets shall consist of one from each Congressional district, one from each Territory, one from the District of Columbia, and ten from the United States at large. They shall be appointed by the President, and shall, with the exception of the ten cadets appointed at large, be actual residents of the Congressional or Territorial districts, or of the District of Columbia, respectively, from which they purport to be appointed.

Another section provides that—

Cadets shall be appointed one year in advance of the time of their admission to the Academy, except in cases where by reason of death or other cause, a vacancy occurs which can not be provided for by such appointment in advance.

Another section provides that the age of appointment shall be from seventeen to twenty-two years.

A joint resolution passed by Congress in 1866 provided that—

In all appointments of cadets to the Military Academy after those who enter the present year, the person authorized to nominate shall nominate not less than five cadets for each vacancy, all of whom shall be actual residents of the Congressional district, Territory, or District of Columbia entitled to the appointment, and the selection of one shall be made from the candidates according to their respective merits and qualifications under such rules and regulations as the Secretary of War shall from time to time prescribe.

And in like manner the President of the United States shall be authorized hereafter to nominate fifty at large each year, instead of ten as now provided by law, who shall be examined under like regulations, and of whom the ten who may be reported as most meritorious and best qualified shall be appointed; provided, however, that not more than two of these shall be appointed in any year from one State.

This joint resolution was approved on June 16, 1866, and was repealed in the following year. It seems to have contained the only reference to the established right of members of the House of Representatives to nominate cadets to be appointed. The custom of such nomination, however, existed long before the act of 1843. The number of recommendations recognized by law would give three hundred and forty-five cadets if every place was full. In practice the Secretary of War appoints the persons nominated by members of Congress, and waits for their nomination before he makes such appointment. In fact, however, partly from delays in the appointment, and more often from failures to fill vacancies, the number of cadets present in the Academy is at all times much less than the number directed under the present law. A quarter of the working force is thus lost. The two principal causes for this loss are:

First. That some vacancies are left open by the delay of Representatives in making the nominations to which by long courtesy they have become entitled.

Second. Through vacancies, by far the larger part of which result from the failure of boys nominated and appointed to pass the first examination, or to fill the places to which they have been appointed. In many instances these last failures seem to result from the fact that the preliminary course has not prepared them for the work of the first year.

To meet the first of these difficulties the Board suggest that members of the House be urged to make nominations at or before the time prescribed, which is one year before the nomination, and in all cases to nominate alternates who may be examined on the failure of the first person named.

The Board also report that it would materially add to the ease and regularity of attendance for examination if examinations were held under the direction of the Academic Board at several other places beside West Point. These examinations should be made from the same sets of question papers, on the same day, and might be held at Washington, Pittsburgh, Atlanta, New Orleans, Chicago, St. Paul, Leavenworth, and San Francisco, at the military posts at or near those cities. They could and should be conducted under arrangements made and with regulations and conditions prescribed by them. The admission or rejection of each candidate should be determined by the Academic Board on consideration of his examination papers, just as it is now.

As the candidate receives an appointment from Government, and is instructed to report for examination at a fixed time and place, there seems to be no reason why all candidates, successful or unsuccessful, should not be paid fair traveling expenses to the place of examination.

The September examination brings young men into the lowest class three months after its work has begun. The results are very unfavorable. The Board recommends that it be abolished and that the candidates who are now referred to it be referred to the next annual examination.

With reference to the gap between the requisites for entrance and the first year, the Board recommends that to the examination as now conducted be added an examination in algebra as far as quadratic equations.

The experience of past years warns us that unless more nominations

are made than are now permitted by law the Academy will not be up to the full number of cadets which could be accommodated here to advantage. The Board, therefore, recommend that the President of the United States nominate five persons at large every year, and keep this number filled when any vacancy is created. We also recommend that each Senator be requested to nominate one person under the same conditions as those under which members of the House now make nominations, and that the President appoint the persons thus nominated for examination and admission to the Academy like other candidates.

DRILLS AND EXERCISES.

The Board attended the infantry, artillery, and cavalry drills of the cadets, and witnessed the exercises in practical military engineering and small arms. They found thorough efficiency in each branch. They had much to commend and nothing to condemn.

A MILITARY POST.

West Point should be a post for a representative body of troops. As the many small frontier posts are abandoned, a sufficient number might be brought to West Point to make it a model military post. Its healthfulness, facility for access or transfer of troops, and the cheapness of supplies, make it an excellent spot for maintaining a considerable force. It would be of great advantage, in a military point of view, to have a picked corps of trained soldiers close at hand and under the eyes of the cadets who, sooner or later, are to command them. A full regiment of infantry, a battalion of cavalry, and a horse battery might be stationed there. As the post would be a desirable one, it might be made a prize to be won, from time to time, by troops attaining the highest standard of soldierly bearing.

DISTRIBUTION OF DIPLOMAS.

The graduates of 1889 received their diplomas on June 13, at the hands of the Secretary of War. The Rev. Edward Everett Hale delivered the address to the graduated class. (See Appendix C.) Gen. William T. Sherman also addressed the class.

CONCLUSION.

The Board, in conclusion, find that the Academy under its present superintendent, Col. John M. Wilson, and its military and academic staff, fully maintains and has increased its reputation as a national military school. The education is both practical and theoretical. The cadets not only receive the most thorough military education, but they are imbued with patriotic fervor, and are instilled with honor. The institution reflects credit not only upon its faculty and upon its pupils, but upon the nation.

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ADDRESS OF THE REV. DR. EDWARD EVERETT HALE TO THE GRADUATING CLASS OF THE U. S. MILITARY ACADEMY, WEST POINT, N. Y.,
JUNE 12, 1890.

GENTLEMEN OF THE GRADUATING CLASS: I count this a peculiar good fortune which gives me the privilege of addressing you. Any one might be glad to be remembered in all parts of the country by such young men for many years in connection with a day which ought to be one of the happiest and proudest of your lives. And I am glad to be intrusted by the gentlemen around me with their congratulations. The timid plebe of 1896 is the accomplished officer of 1890. You are grateful to the Academy which has wrought this miracle. And the Academy to-day admits you to the honorable fraternity of her graduates—bids you share their honors, maintain her fame, defend your country, and serve your God.

On the commencement day of all colleges there is a story told, which is very likely a chestnut here. It is of the graduates of the day found musing apart from his fellows, who is asked what he is thinking of. He answers: "I am trying to see how a man feels when he has received the best education which his country can afford." Possibly you have been working on that problem, though I did not see that the question fell to any one in the examinations. It happens that I am instructed by the Board of Visitors to give you some help in making out the answer. Let us look forward a little while we shake hands in our good-bys. What are the duties and the responsibilities which you carry with you on these well-earned holidays, and after they are over, in your new career?

You will hardly find them stated in the European books. The place and the duty of an American soldier are, thank God, far wider and nobler than those of any servant of a feudal State. You serve the People of America; yes, and you belong to and are part of the People whom you serve. The People, which commands President, Congress, Army and Navy, needed this institution and needed you. It has created this institution and educated you. And you are still of this People, bone of its bone, blood of its blood. You are to quicken its life and make its voice to be the voice of God. This duty, this privilege, you share with all other Americans. You stand, therefore, somewhat as a young prince of the blood of Napoleon might have stood the day he left the military school of Saint-Cyr; or as this young Emperor of Germany might have stood the day he received his first real commission. That is, you not only receive orders from your sovereign; you are looking forward, as well, with a high determination that the orders of that sovereign shall always show the dignity of their source, shall be for the nation's honor, and shall be worthy of the kingdom of the living God.

Few men have an opportunity as large as you have, in this duty, present to the mind of every loyal American, of keeping high, strong, and pure, the spirit of this People. For wherever you go, the nation is visibly behind you. What you say, you say in some sort as her representative. What you do, you do in some sort in her name. If the boys in the street watch and follow your example, why, it is because the nation gives you her commission. If a community in doubt turns to you for counsel, it is because the nation has given to you her instructions. You have been in good hands here. The country knew what she wanted. And she got it, as she always does. What follows is that she expects from you what she has given to you. She has other children, and she expects you to carry forward to them what you have received here at her hands.

I do not mean, of course, that in some frontier post you are to stop a half-breed boy in the street and teach him how he is to make a rational expression out of some highly differentiated equation. But I do mean that when you and men like you have established such a post, there may be and ought to be a simpler confidence in law, a more certain punctuality in action, a more evident justice between man and man; in a word, a higher civilization and social order, because you and yours are representing the nation called the United States of America, in the midst of them. It is not instruction in mathematics or tactics of which we speak; no—it is education in manhood, which it is your power and is to be your duty to extend.

I listened with very great interest to the careful definitions which one of your own number gave, on Saturday, to the great words "conduct worthy an officer and a gentleman." I was glad to see that he was quite ready to enter upon the noble sentiment involved. He was willing to pass behind even the statement of words which could be made in the best of text-books. It was clear enough that somebody, in the spirit of the text-books, or in the instruction of the class-room—very likely in the friendly and familiar chat of the mess-room—had gone back to the magnificent language of the New Testament in its definition of the gentleman. You have the authority of an apostle that the officer who is a gentleman is "first pure." He keeps his body in subjection, as did those men who gained the name of Puritan because they did so. These men—the men who laid the corner-stones of the institutions of the country—were first pure; and because they kept their bodies in subjection they

rode down the impure and profligate cavaliers at Naseby and Marston Moor. The gentleman is first pure. Then he is peaceable. He does not seek a quarrel. There is no chip on his shoulder. This man is the gentleman of the Scriptures and of the Articles of War. And he is a man easy to be entreated, while inflexible in his duty. A man who, as an old writer says, is willing to abate something from his right. A man, as the apostle says, without partisanship. He is no slave to sect or prejudice. What he says is the thing which is. His word is his bond.

Gentlemen of that standard, you are going hence now to a frontier post—now to the capital cities of the nation—to make definite and real to those you meet this visible type of manhood. For this duty and privilege you have an opportunity which any of us, set aside to the special business of lifting higher the moral standard of the community, might envy you; perhaps because we are “set aside” for this, men of affairs are quick to pass us by. You are not set aside; you are in the thick of life. The country bids you stand for her in posts of especial difficulty; she girds you, therefore, with special honors. And the words you speak, or the silence you maintain, or the deeds you do in keeping higher the nation's standard of duty and of honor, have special and peculiar value.

You may never have a pupil to instruct. But you can not help yourselves—you will be the educators of the men around you, with whom, for whatever purpose, you have to do. I might be satisfied to take this simple illustration of the physical training of America. You have been taught all that they say the Roman education involved—to swim, to march, to ride. It will be a proud day for America when, of the fifty million of her sons, she can say that same thing, and a prouder thing when she can say it of her fifty million daughters. To show that the student of language or science is not of necessity a puny stripling, this is one of the lessons which West Point has taught in the past and which you are to beat into the heads of the educators of your time: that athletic training is not to be left to contests as absurd as those of the Blues and Greens of the Byzantine Empire. The country wants men who are men and women who are women, strong to act, healthy to resolve, and quick to do. She ought to be able to look confidently to you for help in that matter of bodily education.

And she wants men and women who can clearly observe, can wisely balance testimony, and can rightly determine. The country means that her children's minds, as well as their bodies, shall be trained and in working order.

And I would speak at length of that matter, of the intellectual education of the country, but that I may refer you so easily to the baccalaureate addresses which are delivered in every college of the country at this time. Read them all, young gentlemen—you will find them in the New York papers of this month—and consider them as addressed to yourselves.

The country, in its passion for education, has undoubtedly attempted too much in the way of mental education—I mean too much in a fair perspective and proportion of the claims of the mind, which is but one tool of the infinite soul, to the claims of the body, which is another tool, and the greater claims of the soul herself, which is to be the mistress of both mind and body. You are to regard yourselves as charged to correct this error where it exists, and to see that the education of this country is made simpler and that this matter of the education of the intellect holds its own proper place in the arrangements which are made for the education of the whole man.

And as for religion, gentlemen—as for the education which brings man closer to his God, that he may know his God, and how to approach to Him, and that he may rightly address God—do not think that any men have an advantage over you. All history is full of the services which soldiers have rendered to the religion of the world. Why should it not be so, when the soldier is known everywhere as the man who understands what life is for, and that death is not the greatest of all evils? He knows that

‘T is not the whole of life to live,
Nor all of death to die.

And, before the world, the soldier is the living illustration of this truth, which the pulpit can only proclaim in language.

Do not forget that I may give a simple instance in those blessings to the world which were wrought out by the four soldiers of the New Testament. The four soldiers of the New Testament need not be ashamed if they were named in the same breath with the four evangelists. It was a captain in the Roman army who, when he had to take charge of a ship because her crew were cowardly, just as you may have to take charge of some transport in the same condition, saved the life of Paul, so that Paul might preach to Nero.

It is another captain in the Roman army who sent his own orderly a day's journey that he might call the Apostle Peter to open to him the treasures of the World. To that soldier's decision and determination, under the Providence of God, the world owed it that the Gentiles were received into the church, which was not left to be a

church of Pharisees. Again it was a soldier who stood at the Cross and gave the testimony, which the men of letters of the time were ashamed to give, or afraid to give. In the words which every man remembers: "Truly this was a righteous man." With such examples one does not wonder when he reads that the Saviour of mankind Himself said of another Roman centurion, "I have not found so great faith, no, not in Israel."

Here are four examples of four deeds of duty well done by four soldiers who took the responsibility in the proper moment. And I would not ask for better examples of what men like you may do in the daily course of common life, in the advancement and promotion of the supreme end of living.

In these illustrations I have spoken to you as I might speak to any well-educated young man just starting upon active life. But there is one great department of the education of the American people where you have opportunities which none of the rest of us have. This country does not know herself. The American People does not know what the American People is or what it can be or can do. The men of the East do not know the power of the West. The new generation of the Pacific does not know the men of the Atlantic. The men of the South do not know the social spirit of the North. The people of the North do not know the traditions or necessities of the South. We are not as badly off as were those colonists who stood together under Washington. But still we do not know our resources, our possibilities, our difficulties, and our greatness. Gentlemen, it is for trained men like you—here to-day and by the Muir Glacier to-morrow, scanning the horizon from Eastport to-day and next week looking out on the Gulf of California—it is for you to reveal the nation to herself. It is for you to conciliate where you find prejudice. It is for you to teach where you find ignorance. It is for you to give the hint, when Vermont can supply what Idaho requires, or when at Fort Wrangel you see a need which could be answered from Florida. This is what is meant when we say that here at last we have one nation organized from many germs, one country made up from many races, and one People swaying all, directing all, and determined that each and all shall go forward to success.

The country is rich, so rich that she does not know her wealth—her wealth is awful in any estimate which approaches the reality. It is for educated men like you, men who see with your own eyes what is East and what is West, who look upon these upon the Arctic and the Caribbean Seas, upon the Pacific and the Atlantic, it is for you to tell her how her treasures shall be used, not for the good of this nabob, nor of that section, but for the improvement and blessing of all.

I was very much impressed by an anecdote told me of President Grant by one of his companions in his journey around the world. At any place where he was received with such honors as princes dare not claim, he was asking questions, he was using his eyes and his ears, and informing himself as to what there was, or what there was not, which might be useful to America—to the commerce or the manufactures or the social order of the people which he loved and the people which loved him. I was reminded of another story of him which Dr. Sears told me. Dr. Sears was the secretary of the Peabody Board of Education. He knew intimately the details of its wide administration. There came a matter which he thought the President should know, the nominal head of the board, which he thought would not have fallen under his notice in the wide range of the executive duties. So he waited on him at the White House and told his story. The President listened, and took from a file of letters the statement of the same affair made to him by the personal correspondent on whose information in that quarter he relied.

Believe me, gentlemen, there is no danger that you will know too much as to your country, her needs, or her possibilities. They asked Daniel Webster once when he would argue a critical case regarding the national jurisdiction, on which vast interests depended. It was the Ogden Gibbons case. "I will try it now," said he. "But do you not need some time for preparation?" "I made my preparation when I had no briefs to study, and was waiting for my first clients at the cross-roads in Franklin, in New Hampshire."

Give yourselves to your country, gentlemen, in every least detail of present service, or in the great crises which history tries to represent, on which hang the destinies of freedom. Give yourselves to her. You may serve her as Grant served or as Sherman still serves her. You may serve her in some new invention or discovery as Ericsson served her or Eli Whitney. You may serve her in the conciliation and sympathy by which you make friends of those who have been separated, as General Crook served her when he made an Apache baby play with the white man's doll.

Be the detail as it may, from this moment you serve her, you serve her in your obedience to any officer she commands. Always this loving mother is there—it may be behind the curtain—but it is her voice which you obey. The message of her will may come to you in a cramped hand-writing, on a mean bit of yellow paper; it may be given by only a very dirty telegraph boy, and he may be surly as he gives it, but it is your mother's message to you all the same, and your part is to do her will with all a loyal son's devotion.

ng to her as you belong to your own mother. Stand by her, boy, as you would
d by your own mother if those devils yonder had got hold of her to-day."

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REPORT OF THE SECRETARY OF THE NAVY.

NAVY DEPARTMENT,
November 26, 1890.

To the President:

Since March 4, 1889, nine new vessels, which were at that time in various stages of progress, the first two being practically out of the constructor's hands, have been completed and put in commission, as follows:

Name.	Tonnage.	Com- missioned.
	<i>Tons.</i>	
Chicago	4,500	Apr. 17, 1889
Yorktown	1,700	Apr. 23, 1889
Petrel	870	Dec. 10, 1889
Charleston	3,730	Dec. 26, 1889
Baltimore	4,400	Jan. 7, 1890
Cushing	99	Apr. 22, 1890
Vesuvius	970	June 7, 1890
Philadelphia	4,300	July 28, 1890
San Francisco	4,083	Nov. 15, 1890

During the coming winter four more will be added to the list, namely:

	<i>Tons.</i>
Newark	4,083
Concord	1,700
Bennington	1,700
Miantonomoh	3,815

Of the other vessels which had been authorized prior to the above-mentioned date, four were at that time more or less advanced:

	<i>Tons.</i>
Paritan	6,060
Amphitrite	3,815
Monadnock	3,815
Terror	3,815

One had been fairly begun:

Maine	6,648
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The designs of seven were nearly completed, but their actual construction had not yet been undertaken.

Authorized August 3, 1886:	Tons.
Texas	6,314
Authorized March 3, 1887:	
Monterey	4,000
Authorized September 7, 1888:	
Cincinnati (No. 7)	3,000
Raleigh (No. 8.)	3,000
Cruisers 9, 10, and 11	2,000

Six had not yet been designed:

Authorized September 7, 1888:	
New York (armored cruiser 2)	8,150
Cruiser 6	5,500
Practice vessel	250
Authorized March 2, 1889:	
Harbor defense ram	2,000
Gun-boats 5 and 6	1,000

Of the fourteen vessels last mentioned all are now well advanced in construction, with the exception of the ram, upon which proposals were invited October 18, 1890. There remain two other vessels, the dynamite gun-boat No. 2, whose construction was authorized conditionally, in case the *Vesuvius* proved a success, which fact has not yet been demonstrated; and the armored cruising monitor, also an experimental design, whose features hardly seem to meet the present demands of naval construction.

It thus appears that during the twenty months covered by the present administration nine new ships have been put in commission; four, including one monitor, have been advanced to a point where they are just about to go into commission; five are in such a condition that they will shortly be waiting only for their armor; seven have been built from the keel up, of which the *Texas* and *Monterey* are nearly ready for launching, and the five cruisers are well advanced; while of the six others previously authorized all have been designed and advertised, and all but one, the ram, have been contracted for and are actually under construction.

The first five vessels on the list—the *Chicago*, *Yorktown*, *Petrel*, *Charleston*, and *Baltimore*—were sufficiently described in the annual report of last year. Since that date all have been actively cruising, and all have justified, under the severe test of actual practice, the high expectations which were then formed of their efficiency as sea-going men-of-war.

Of the last four vessels placed in commission, the torpedo-boat *Cushing*, built by the Herreshoff Manufacturing Company of Bristol, R. I. is the first, and as yet the only craft of this description in the Navy, although a second has been authorized. She is built of steel, and has developed a speed of 23 knots. Her armament will consist of 3 torpedo-tubes and four 1-pounder guns. She not only compares favorably with for-

eign torpedo-boats, but stands very near the head of her class. If this country had twenty others like her, and had them equipped with effective torpedoes, they would be a material addition to its means of defense. As long as it has but two, they will be of little service otherwise than to show what native skill and ingenuity can do in this direction. Their effectiveness as compared with their small cost should induce a marked increase in their number.

To illustrate the extensive use of these boats the following table is subjoined, being a revision brought to date, of a similar table presented last year.

Torpedo boats built, building, or projected, 1889 and 1890.

Nation.	Number of boats.		Increase during past year.
	1889.	1890.	
France.....	191	210	19
England.....	207	206	(*)
Germany.....	98	180	82
Italy.....	128	152	24
Russia.....	138	143	5
Austria.....	60	61	1
Greece.....	51	51	.....
Holland.....	16	50	34
Denmark.....	23	34	12
China.....	26	32	6
Norway and Sweden.....	19	31	12
Turkey.....	29	30	1
Japan.....	21	24	3
Spain.....	15	15	.....
Brazil.....	15	15	.....

* One boat lost.

The *Vesuvius*, built by William Cramp & Sons, was given her final trial May 10, 1890, to ascertain her indicated horse-power. This was determined to be 3,794, being 594 in excess of the contract requirement. The estimated speed developed during the eighteen minutes of the trial was 21.42 knots an hour. The vessel is still an experiment, the trial of her dynamite guns and the tactical test of the ship having been delayed by the want of projectiles, which the company has thus far been unable to supply.

The *Philadelphia*, also built by William Cramp & Sons, underwent her contract trial June 25, 1890, and developed 8,814 horse-power and a speed of 19.68 knots. This vessel is a sister ship of the *Baltimore*, and it is believed will, upon developing the full capacity of her boilers, and under more favorable conditions, surpass not only her own high record, but possibly also that of her consort, the hulls of the two ships being nearly identical, while the *Philadelphia* has a greater heating-surface on her boilers, and, in some respects, improved engines.

The trial of the *San Francisco*, built by the Union Iron Works, took place August 27, 1890. The horse-power developed was 9,912, and the speed 19.52 knots. During the last half hour the speed from bearings was 20.17. An accidental circumstance occurring during the trial, caused an essential reduction in speed, and it is, therefore, probable that in her case, as well as in that of the *Philadelphia*, the ship will ultimately beat her own record.

It is no longer necessary, in considering the speed of the new ships of the Navy, to make comparisons with foreign vessels. We have now our own standard, and we have the right to congratulate ourselves that the standard is unsurpassed by any other navy in the world.

The *Newark* has been built by William Cramp & Sons. Her official trial is about to take place as this report goes to press.

The *Concord* and *Bennington* were each about half finished in March, 1889, under contract with N. F. Palmer, jr., & Co., of New York, the hulls being under construction at the Delaware Iron Works, Chester, Pa. A trial of the *Concord* took place November 18, 1890. The engines failed to develop the required horse-power, and another trial will shortly be had. The *Bennington* is nearly finished, and will receive her trial on December 20.

The completion of the *Miantonomoh* is only delayed by her ordnance and electrical plant. Three of her guns are in position, and the fourth will shortly be ready for trial. The ship will be ready for commission in about three months.

The next group of vessels consists of the four monitors, which have been in process of construction for many years without much prospect of reaching a final result in any ascertainable future period. For the first time in their history, the Department may now safely predict their speedy completion.

The *Puritan* has undergone a radical and most important change of design in the substitution of barbette for roller-base turrets, and of 12-inch for 10-inch guns. The change, requiring a new schedule of materials, involved further delays in this already much-delayed vessel, but it has added so greatly to her efficiency that it was worth waiting for. Proposals for the materials were received September 16, 1890, and contracts were awarded, upon the performance of which the work will be carried forward rapidly to a close.

The *Amphitrite*, now at the navy-yard, Norfolk, has undergone an alteration in plans by which she is to be completed in accordance with the plan of the *Puritan*. The old turret gear has been removed, as well as certain beams, bulkheads, and framing, and the ship is ready for the new work as soon as the material shall be delivered.

The *Monadnock*, at the Mare Island navy-yard, is also to be fitted with barbette turrets. Approved plans were forwarded March 26, 1890, and the alterations have progressed so far that the work can now be rapidly finished.

The *Terror* has undergone material alterations in design. The berth-deck beams have been replaced by heavier sections, and the berth-deck plating has been completed. The after turret is half finished, and the forward turret two-thirds finished. Further changes have been necessitated by the installation of the pneumatic system of turning the turrets, and the steering and refrigerating apparatus, all of which were contracted for by the Department April 25, 1888. This installation will be completed by next summer.

All the double-turreted monitors will be ready for their armor as soon as it can be delivered, and if there is no unforeseen cause of delay about the deliveries all will be in commission at some time in 1892.

The *Maine*, constructed at the Brooklyn navy-yard, stands in a class by herself. Her first keel-plate was laid October 11, 1888. The work on the vessel has been pushed with the utmost vigor, and she was launched successfully on the 18th of November, 1890. She is the first ship of her size ever built in a navy-yard, and her workmanship would reflect high credit upon any establishment. Three of her four 10-inch guns have been forged, and are in course of manufacture at the Washington Gun Factory. Her machinery, building by contract, is making good progress, and she has for some time been ready for her armor, the delay in obtaining it having necessitated a slight modification in design. If no further delay occurs in this respect, the ship will be in commission by July, 1892.

Of the vessels whose actual construction was begun subsequently to the commencement of this administration, the most important is the second-class battleship *Texas*, building at the Norfolk navy-yard. The keel was laid June 1, 1889, and although the work has been kept back by the non-delivery of material, the ship will, in all probability, be ready for launching in the summer of 1891.

The *Monterey*, building at the Union Iron Works, under contract of June 14, 1889, has undergone an entire alteration in the battery, two 12-inch guns having been substituted for the single 16-inch in the forward barbette, and two 10-inch for the single 12-inch in the after barbette. She will be ready for launching about January 1, 1891, and if her armor is promptly delivered, will be entirely finished early in 1892.

Of the five cruisers authorized in 1888, Nos. 7 and 8, named respectively the *Cincinnati*, and the *Raleigh*, and Nos. 9, 10, and 11, the first two are progressing satisfactorily at the navy-yards at New York and Norfolk, and the other three are under contract to be completed in May, 1892. The *Raleigh* and *Cincinnati* may be looked for about the same time, or perhaps earlier.

GUNBOATS.

In the last group, consisting of six vessels, the first designed were the two gunboats and the practice vessel. The advertisement of these

vessels was published November 19, 1889, and proposals were January 22, 1890, as follows :

Bath Iron Works, of Bath, Me., for the construction of two gun-boats.....	
The Samuel L. Moore & Sons Company, of Elizabethport, N. J., for the construction of two gun-boats.....	
Bath Iron Works, of Bath, Me., for the construction of one gun-boat.....	
The Samuel L. Moore & Sons Company, of Elizabethport, N. J., for the construction of one gun-boat.....	
Atlantic Iron Works, of Boston, Mass., for the construction of one gun-boat.....	
The Samuel L. Moore & Sons Company, of Elizabethport, N. J., for the construction of two gun-boats and practice vessel.....	
The Samuel L. Moore & Sons Company, of Elizabethport, N. J., for the construction of one gun-boat and practice vessel.....	
The Samuel L. Moore & Sons Company, of Elizabethport, N. J., for the construction of practice vessel.....	

For the construction of the hull and machinery, including boilers, and appurtenances, complete in all respects, in accordance with the plans and specifications provided by the bidder: Atlantic Iron Works, of Boston, Mass., for the construction of one gun-boat, \$318,500.

The proposal of the Samuel L. Moore & Sons Company, of Elizabethport, N. J., was the lowest received for the construction of the boats, and the only one for the construction of the practice vessel. The bids could not, however, be considered, because the company did not then have and could not show that it would within three months from the date of the contract become possessed of the necessary plant for the construction of the vessels, as required by the acts authorizing them.

The bid of the Bath Iron Works, of Bath, Me., for the sum of \$631,000 (\$318,500 each), being the next lowest one received for the construction of the gunboats, was accepted, and contracts were entered into with that company April 12, 1890, for the construction of the gunboats, in accordance with the Department's plans and specifications for hull and machinery. The contracts require that the vessels shall be completed and ready for delivery to the United States on or before the expiration of two years from the date of the contracts.

The practice vessel was again advertised on April 8, and proposals were opened June 10, 1890, as follows :

Hull and machinery, including engines, boilers, and appurtenances, complete in all respects, in accordance with the plans and specifications provided by the Secretary of the Navy.

F. W. Wheeler & Co., of West Bay City, Mich.....	
The Samuel L. Moore & Sons Company, of Elizabethport, N. J.....	

Messrs. F. W. Wheeler & Co., of West Bay City, Mich., were the lowest bidders, but the Department could not, under existing stipulations, award a contract for the construction of a vessel for service upon the Great Lakes, and their proposal was therefore rejected. The proposal of the Samuel L. Moore & Sons Company, of Elizabethport, N. J., was the next lowest.

N. J., for \$250,000, was the next lowest received, and the company having now satisfied the Department that it was possessed of the necessary plant for the construction of the vessel, a contract was entered into July 18, 1890, for the construction of the vessel upon the Department's plans and specifications for the hull and machinery. The contract requires that the vessel shall be completed and ready for delivery to the United States on or before the expiration of two years from the date thereof.

PROTECTED CRUISER NO. 6.

At the same dates as in the case of the practice vessel, the Department advertised and opened bids for the protected cruiser of 5,500 tons (No. 6), authorized September 7, 1888. The following bids were received:

Union Iron Works, of San Francisco, Cal., for the hull and machinery, including engines, boilers, and appurtenances, complete in all respects, in accordance with the plans and specifications provided by the Secretary of the Navy.....	\$1,796,000
Union Iron Works, of San Francisco, Cal., for the hull and machinery, including engines, boilers, and appurtenances, complete in all respects, in accordance with the plans and specifications provided by the bidder..	1,700,000

The Union Iron Works being the only bidder, their bid for the sum of \$1,796,000 was accepted, and the contract awarded accordingly. The contractor subsequently agreed to lengthen the vessel by 10 feet, in order to secure more space in the fire-room, the cost of the change to be borne by himself. The contract, dated July 10, 1890, required that the ship should be completed and ready for delivery to the United States on or before April 1, 1893. The vessel has been laid down and the preparatory work is progressing satisfactorily.

Cruiser No. 6 belongs to the recognized cruiser type, but her greater size permits an expansion in those qualities wherein the ordinary cruisers are most defective—coal-endurance and sustained speed. Her coal capacity is 1,300 tons, which gives her an effective radius of 13,000 miles, a distance far in excess of the average vessel of this type. The additional weight of her machinery enables her to reach not only the guaranteed trial speed of 20 knots, but a sustained sea speed of 19 knots, which is at least 2 knots in excess of that ordinarily maintained by ships of her class. Added to these advantages are unusual protection for the guns and a powerful battery, in which the rapid-firing feature is distinctly marked. The main armament consists of four 8-inch and ten 5-inch guns, while the secondary battery comprises fourteen 6-pounders, six 1-pounders, and four Gatlings; in all, fourteen heavy and twenty-four light pieces. A water-excluding belt worked in above the protective deck and 4 inches of armor protection for the guns and ammunition-hoists make the element of defensive strength one of the marked characteristics of this ship. The combination of sustained speed, exceptional coal endurance, powerful battery, and a certain amount of armor protection make her a cruiser of no ordinary character.

THE NEW YORK.

By far the most important vessel in this group, and in many respects one of the most important vessels of the new Navy, is the armored cruiser No. 2, named the *New York*, advertised and bid for on the same dates as the two vessels last mentioned. The bids on this ship were as follows:

Class 1.—Hull and machinery, including engines, boilers, and appurtenances, complete in all respects in accordance with the plans and specifications provided by the Secretary of the Navy:

The Wm. Cramp & Sons Ship and Engine Building Company, of Philadelphia, Pa.....	\$3,150,000
Union Iron Works, of San Francisco, Cal.....	3,100,000
Balden Iron and Locomotive Works, of San Francisco, Cal.....	3,450,000

Class 2.—Hull and machinery, including engines, boilers, and appurtenances, complete in all respects in accordance with the plans and specifications provided by the bidder:

Union Iron Works, of San Francisco, Cal.....	\$3,000,000
The Wm. Cramp & Sons Ship and Engine Building Company, of Philadelphia, Pa.....	2,985,000

The proposal of Wm. Cramp & Sons for \$2,985,000, being the lowest received, was accepted, and a contract was entered into August 28, 1890, for the construction of the ship according to the Department's plans and specifications for the hull and machinery, as modified by the bidder; the modifications embracing a re-arrangement of the boilers, so that additional longitudinal and transverse bulk-heads could be fitted in the engine and boiler spaces, thereby affording greater protection to the machinery, and rendering the vessel less vulnerable to attacks from rams and torpedoes. The keel was laid September 30, 1890, and the contract requires that the vessel shall be completed and ready for delivery to the United States on or before January 1, 1893.

The object which the Department has aimed at in the *New York*, and which, it is confidently believed, has been attained, is an unusual combination of great offensive and defensive power, with extraordinary coal-endurance, and a high rate of speed. All armored vessels, as has been repeatedly said, though it can not be said too often, are a compromise between the conflicting elements of battery, armor, endurance, and speed upon a given size or displacement. Increase one of these elements, the size remaining the same, and some one of the others must be decreased.

In the *New York* the speed given, 20 knots, is sufficient to enable her to escape from any more powerful ship afloat to-day, and to overtake the vast majority—certainly 95 per cent.—of all the ships of the world, naval or mercantile. At the same time her size and draught are not excessive. Her coal capacity permits her to complete without re-coaling a voyage of 13,000 miles. Her armored deck is 3 inches in the flat with 6-inch slopes; her sides have a complete belt of water-excluding mate-

rial, and in the wake of the engine spaces 5 inches of armor, while four of her heavy guns are protected by 10-inch barbettes and 7-inch shields. Her battery, composed of six 8-inch and twelve 4-inch guns, is unequaled by any ship of the cruiser type in the world, while it gives her chances which are not to be despised should she be driven to a momentary encounter with a battle-ship. Fighting battle-ships, however, is not her business; she is built to keep the sea and thus destroy an enemy's commerce, and not only his commerce but any commerce destroyer he may send out. She is thus both a commerce protector and a commerce destroyer of the highest efficiency. Four such ships, distributed in various quarters, would put an effectual stop to the depredations of as many fleets of ordinary cruisers. For general purposes of service in war she is believed to have a wider field of usefulness than any other ship yet designed for the Navy.

HARBOR-DEFENSE RAM.

The last vessel on the list is the harbor-defense ram, authorized by the act of March 2, 1889, after designs by Rear-Admiral Daniel Ammen, U. S. Navy. This vessel has an armored deck and sides. Her displacement is 2,050 tons, she is to have a speed of 17 knots, and she is intended solely for ramming purposes. The only projections above her armored deck are the conning tower, with 18 inches of armor, the ventilators of the smoke-pipes, and the hatch coamings. Advertisements were issued October 18, 1890, inviting proposals, which are to be opened December 20.

VESSELS AUTHORIZED BY THE PRESENT CONGRESS.

Until the year 1889, the modern additions to the Navy consisted chiefly of cruisers of from 3,000 to 4,500 tons, and of gun-boats of under 2,000. The projected armored vessels included the *Maine* and the *Texas*, battle-ships of the second class, and one harbor defense vessel, the *Monterey*. In the annual report of last year, the Department advocated a new departure in naval construction, and strongly urged the policy of building first-class battle-ships, as being by far the most important constituents of a defensive force, capable of effective use in time of war. Congress carried out this policy, and in the act of June 30, 1890, authorized the construction of three sea-going coast-line battle-ships.

Under the conviction that not a moment was to be lost in obtaining these vessels, deemed to be so vital to the defense of the United States, the Department gave urgent instructions to the Bureaus, and the latter, with a promptness unexampled in the history of naval administration in this country, actively set about the preparation of designs, in anticipation of the passage of the act. The result was that on the 1st of July, the day after the act was approved, the general plans were ready and the advertisements issued inviting proposals. The detailed plans were so pressed during the summer that not an employé of the Bureaus of Construction or Steam Engineering was allowed leave of

absence, and on the 1st of October, exactly three months after the ships were authorized, bids for their construction were opened.

The bids were as follows:

Class 1.—For the construction of the hull and machinery including engines, boilers, and appurtenances, complete in all respects, in accordance with the plans and specifications provided by the Secretary of the Navy:

Union Iron works of San Francisco, Cal. (for one vessel)	\$3,240,000
Risdon Iron and Locomotive Works of San Francisco, Cal. (for one vessel) ..	3,275,000
The William Cramp & Sons Ship and Engine Building Company of Philadelphia, Pa. (for one vessel).....	2,900,000
Bath Iron Works, Limited, of Bath, Me. (for one vessel)	3,142,000
Union Iron Works of San Francisco, Cal. (for two vessels)	6,400,000
The William Cramp & Sons Ship and Engine Building Company, (for two vessels).....	5,780,000
The William Cramp & Sons Ship and Engine Building Company (for the third vessel)	2,900,000

Class 2.—For the construction of the hull and machinery, including engines and boilers and appurtenances complete in all respects, in accordance with the plans and specifications provided by the bidder.

The William Cramp & Sons Ship and Engine Building Company (for one vessel)	\$3,120,000
The William Cramp & Sons Ship and Engine Building Company (for two vessels).....	6,040,000
The William Cramp & Sons Ship and Engine Building Company (for the third vessel)	3,120,000

The proposal (Class 2) of William Cramp & Sons was the only one received for the construction of the ships on the Department's plans as modified by the bidder. The modification consists simply in lengthening the vessel by 12 feet. Being the only proposal in this class, and being lower than the proposal of any other bidder in either class, for the construction of two vessels, namely, for the sum of \$6,040,000 for both, or \$3,020,000 each, it was accepted, and contracts were awarded to the company for the construction of the vessels upon the Department's plans and specifications, but increased in length by 12 feet.

The proposal of the Union Iron Works for the construction of one of the battle-ships upon the Department's plans, for \$3,240,000, was greater by \$120,000 than that of Cramp & Sons, and the Department informed the Union Iron Works that, in view of the requirement of the law that one of the vessels should be built on or near the Pacific coast, if it could be done at a fair cost, the contract for the third battle-ship, in accordance with the Department's plans, but like the other two lengthened 12 feet, would be awarded to that company as the lowest bidder on the Pacific coast, provided the company would reduce its price \$60,000. The Union Iron Works agreed to accept the contract under these conditions, and it was accordingly awarded to that company for \$3,180,000, which is only \$60,000 more than the lowest bid on the Atlantic coast. This additional sum was considered reasonable in

view of the increased cost, estimated by actual calculation, of the transportation of material necessarily obtained at the East.

The three vessels are required to be completed within three years from the date of contract, that is to say, in November, 1893. They are named the *Indiana* (No. 1), the *Massachusetts* (No. 2), and the *Oregon* (No. 3).

In these battle-ships the Department confidently asserts that the United States will become possessed of three vessels of the highest power, whose equal as fighting ships does not exist at the present day. The vessels being for purposes of coast-line defense, it was unnecessary to emphasize the feature of coal-endurance to the extent of any such extraordinary figure as has been attained in the *New York* and in No. 6, and still more in No. 12. This feature has not been slighted, however, for the radius of operation of the ship is 5,000 miles, equal to that of many cruisers; but it is not the principal feature. The first object of these vessels is to fight, and fighting machines they will be, of the highest efficiency.

As with coal endurance so with speed. The speed of the battle-ships has not been neglected, being 16.2 knots as a maximum and 15 knots sustained sea-speed, but it has not been made the main object. It is not a necessity, as in the case of cruisers; the duty of the battle-ships is to fight, not to run, and these ships will never have occasion to run from a hostile fleet of equal or even slightly superior numbers, whatever the vessels of which that fleet is composed. They are the first United States vessels, with the exception of those iron-clads which the War compelled us to obtain in advance of other states, of which this fact could be asserted.

The battery of the battle-ships is the heaviest and most effective in battle carried to-day by any ship afloat or projected, and its disposition is such as to make it tell with terrific effect. Above the armored deck, 80 feet from the center of the ship, rise two redoubts, inclosing the foundations of revolving turrets, within which are the four great 13-inch rifles, 18 feet above the water, and sweeping through a clear arc of 270 degrees, forward and aft and on both broadsides. Above these, on the heavy superstructure between the turrets, 25 feet above the water-line, and therefore capable of firing over the turrets, are eight 8-inch rifle-guns that at two miles can pierce the armor of many modern ships. Four 6-inch guns complete the main armament.

The secondary battery consists of sixteen 6-pounder rapid-firing guns, four 1-pounders, and four Gatlings, so disposed that a rain of projectiles can be thrown upon every point of approach, sufficient to destroy any light boat that may venture within range. The vessel also carries six torpedo-tubes, two of them fixed at the bow and stern and four adapted for training upon the sides.

The provision for defense is as thorough and effective as that for offense. A water-line belt of steel armor 18 inches thick and $7\frac{1}{2}$ feet wide extends over three-fourths of the ship, turning in forward and aft

where it sweeps around the base of the redoubts. At the ends are heavy under-water protective decks, sloping at the sides far below the water-line. An armored deck also extends above the space inclosed by the belt, and full use is made of all the modern devices to secure invulnerability—water-excluding material in the slopes of the protective deck, coal bunkers, and multiplicity of water-tight compartments.

The bow of the ship consists of a powerful ram, and both bow and stern above the protective deck can be entirely shot away without endangering the safety of the ship.

The Department submits this statement of the main features of these vessels with no further comment. It regards them with peculiar interest, for they were only acquiesced in upon its earnest solicitation, and in the face of many misgivings, to which free utterance was given both in Congress and in the press. As designed they challenge comparison with the battle-ships of the world. There are others in existence of greater size; none of greater power or efficiency. Nor can it be doubted by any one who has watched the progress of naval construction in America that their performance, when the work is completed, will equal the highest expectations that are formed of them to-day.

PROTECTED CRUISER NO. 12.

As in the case of the battle ships, the protected cruiser (No. 12) of 7,350 tons, authorized by the same act, was advertised on the day after the bill for its construction became a law, July 1, 1890, and bids were received and opened on the 1st of October. They were as follows:

Hull and machinery, including engines, boilers, and appurtenances, complete in all respects, in accordance with the plans and specifications provided by the Secretary of the Navy—

The Wm. Cramp & Sons Ship and Engine Building Company, of Philadelphia, Pa.....	\$2,725,000
Union Iron Works, of San Francisco, Cal.....	3,025,000

The proposal of William Cramp & Sons was the only one received that came within the limit fixed by the law, and was accepted, and a contract was signed accordingly on November 19, 1890, for the construction of the vessel, upon the Department's plans, to be completed within two years and six months from the date of the contract, that is to say, May 19, 1893.

In Cruiser No. 12, the Department has sought to produce a vessel absolutely without parallel among the war ships of the world. The combination here made unites a sufficient armament with complete protection against light guns, while at the same time the vessel will have a sea speed and a coal endurance hitherto unknown in ships of war. She will be a match for the most swift transatlantic liner afloat to-day, carrying any armament of which such a vessel is capable. No merchant vessel that she meets, armed or unarmed, can escape from her.

The displacement of cruiser No. 12 is 7,400 tons. Her battery will be composed of one 8-inch 40-caliber rifle, two 6-inch rifles, eight 4-inch

rapid-firing guns, twenty rapid-fire guns and six torpedo tubes. The heavy protective deck, 4 inches thick on the slopes and 2½ inches elsewhere, covers completely her vital parts, while a coffer-dam, 5 feet in width, is worked next to the side for the whole length, filled, in the central portion, with patent fuel capable of use in an emergency, and forward and abaft with water-excluding material. Four-inch and 2-inch plates in the wake of the rapid-firing and machine guns further protect the ship's side, while the 6-inch and 8-inch guns are protected by heavy shields attached to the carriages.

The machinery consists of three sets of triple-expansion engines driving three screws, the third screw being placed between and below the other two and 15 feet farther aft. With this triple reliance it is almost impossible to conceive of a combination of circumstances that would render the vessel helpless. A further advantage of the triple-screw device is that by simple arrangements any one of the three screws can be disconnected and left free to revolve, thus offering only a slight resistance to the progress of the ship when she is propelled by one or two engines.

When high speed is not essential, a small number of boilers can be used with high pressure and a single engine driven at its full power, thereby preventing the waste that is inevitable when a large engine is run at a low power. The engines are arranged in three separate watertight compartments, each complete in itself and independent of the others, so that any two might be entirely disabled without interfering with the working of the third. By means of this machinery, the enormous horse-power of over 20,000 is developed, and the result is that the ship, by an arrangement as effective as it is economical, will be able to run with one screw and one-third power at 15 knots, with two screws and two-thirds power at from 18 to 19, and with three screws and full power at a maximum of 22 knots and a sustained average of 21.

Finally the coal capacity of the ship is fixed at 2,000 tons, which at 10 knots an hour, will give her an endurance of one hundred and three days, or a radius of action of 25,520 knots. She needs neither colliers nor coaling stations for she carries both between her decks. In other words this ship, so powerful in offensive force as to equal all ordinary cruisers, so well protected as to be hardly vulnerable to the lighter class of guns, so abundantly supplied with separate engines as to be incapable of being wholly disabled, can steam completely around the world without touching at any point for coal, and without receiving fresh supplies from colliers; and yet when the occasion arises, she can overtake with ease the fleetest of the ocean greyhounds. Six such ships would exterminate the commerce of any country under the present conditions of commerce protection, and would thus, under these conditions, absolutely preclude an attack from a commercial state, however threatening in its demands, powerful in its armored fleet, or aggressive in its foreign policy.

There remain two items in the act of June 30, 1890, the torpedo cruiser

and the torpedo boat. The former is a fleet gunboat of 750 tons, required to develop a speed of 23 knots, with a premium for every quarter knot in excess; the latter will bear a general resemblance to the *Cushing*, and will be required to develop 24 knots, with premium for excess. Both were advertised October 18, 1890, and bids will be opened December 20 for the torpedo boat, and February 11, 1891, for the torpedo cruiser.

Of the four steam-tugs authorized by the act of March 2, 1889, one was purchased upon an offer received under the Department's advertisement of June 25, 1889. The bids for the others were rejected as being excessive, and a second advertisement was issued May 10, 1890, inviting proposals for the remaining three. No proposals were received under this advertisement.

It being apparent that the plans and specifications proposed by the Department called for a more expensive tug than could be built for the sum appropriated, viz, \$35,000, with a fair margin of profit for the contractor, the specifications were modified and a new advertisement was issued September 3, 1890, under which the following proposals were received:

Name of bidder.	1 tug.	2 tugs.	3 tugs.
Globe Iron Works Company.....			\$102,500
The Pusey & Jones Company.....	\$45,000	\$28,000	72,000
John H. Dialogue.....			90,000
James Clark & Co.....	34,500	68,500	
Needle & Levy.....	33,364		100,000
Harrison Loring.....			97,314
The Sam'l L. Moore & Sons Company.....	34,500	68,250	102,000

The proposal of Harrison Loring being the lowest one received for the construction of all the tugs, was accepted, and contracts were awarded to him accordingly. The tugs are to be complete and ready for delivery within twelve months from the date of the contracts.

NAVAL REVIEW OF 1893.

Congress, in an act approved April 25, 1890, made the following provision for the holding of a naval review at the time of the Columbian Exhibition:

SEC. 8. That the President is hereby empowered and directed to hold a naval review in New York Harbor in April, eighteen hundred and ninety-three, and to extend to foreign nations an invitation to send ships of war to join the United States Navy in rendezvous at Hampton Roads and proceed thence to said review.

The rapidity with which construction has proceeded during the past year and the promising outlook for the coming two years are such that if no delay is caused by failure of appropriations in the completion of the contracts now outstanding, the Department can safely present its list of vessels, which, with the exception of those required for service at the time, will take part in the projected review of 1893, the grandest naval demonstration that, up to that time, will have taken place upon the Western Hemisphere.

Name.	Type.	Ton- nage.	Name.	Type.	Ton- nage.
ARMORED VESSELS.			UNARMORED VESSELS—		
1st rate:			continued.		
New York	Cruiser	<i>Tons</i> 8,150	2d rate—continued:		<i>Tons.</i>
Maine	do	6,648	Boston	Cruiser	3,189
Texas	Battle-ship	6,314	Atlanta	do	3,180
Puritan	Monitor	6,060	Raleigh	do	3,000
2d rate:			Cincinnati	do	3,000
Monterey	Monitor	4,003	3d rate:		
Amphitrite	do	3,815	Cruiser 9	Cruiser	2,000
Miantonomoh	do	3,815	Cruise 10	do	2,000
Monadnock	do	3,815	Cruiser 11	do	2,000
Terror	do	3,815	Bennington	Gun-boat	1,700
3d rate:			Concord	do	1,700
Harbor-defence ram		2,050	Yorktown	do	1,700
UNARMORED VESSELS.			Dolphin	do	1,485
1st rate:			Gunboat No. 5	do	1,000
Cruiser No. 6		5,500	Gunboat No. 6	do	1,000
2d rate:			4th rate:		
Chicago	Protected cruiser.	4,500	Vesuvius	Dynamite-gun vessel	970
Baltimore	do	4,400	Petrel	Gun-boat	870
Philadelphia	do	4,300	Practice vessel	do	835
Newark	do	4,083	Torpedo cruiser	do	750
San Francisco	do	4,083	Cushing	Torpedo boat	100
Charleston	do	3,730	Torpedo boat No. 2		112

ARMOR.

The Department during the past year has experienced great disappointment in reference to the armor contract of the Bethlehem Iron Company. This contract, which was justly considered the crowning triumph of my predecessor, was signed on June 1, 1887, and called for the completion of a plant for the manufacture of armor two and one-half years from the date of the contract—that is, on December 1, 1889. It further provided for the delivery of 300 tons within two months from and after the expiration of the contract time for the completion of an adequate plant, delivery to be continued thereafter at the rate of 300 tons per month, and to be fully completed within two years from the date of such first delivery. On the date fixed by the contract the work of constructing the plant was far from completion.

The Department has endeavored during the past year, by every means at its command, including remonstrance, solicitation, and urgent request, to hasten the performance of the work. Repeated assurances have been given by the company, fixing various prospective dates, only to be followed by new disappointments. When it is considered that this contract includes the side and turret armor for all the monitors and for the *Maine* and *Texas*, the serious consequences of the delay are manifest.

In January, 1890, the company stated that they would be ready to

begin manufacture within six months, and would be able to deliver from 1,500 to 2,000 tons this year; but this prospect ended, like previous ones, in disappointment. In July the company said:

While the estimate, as stated in our letter of January 25, 1891, as to the time of beginning manufacture, was at fault, we are still expecting to commence within the next two months the manufacture of certain armor, for which [we have received drawings, and which we understand is now urgently needed, namely: The bulk-head plates of the *Maine*, the conning tower of the *Terror* and the conning-tower communications of the *Texas*. As to the amount of plates that we hoped to deliver at the time of your interview, * * * we expected to be able to produce a considerable amount of *thick plates* with our present appliances, and added to this, if the protective deck plating covered by Exhibit U of our specifications were now needed by the Department, we could arrange to have a considerable portion of it rolled elsewhere and brought to our works for shaping, tempering, and fitting, and thus also in good part fulfill our statement as to the *amount* we could deliver during the present year.

We are fully aware, however, that the deliveries above referred to are of the nature of temporary expedients, and that the end so earnestly desired by all parties concerned, and of paramount importance, viz, the completion of our hammer plant and the regular deliveries of the hammered and tempered plates for side armor, has been and will be delayed beyond our expectations.

As is always the case in undertakings of such magnitude, the causes of delay have been numerous, and while no "unforeseen contingencies" have arisen of such a pronounced nature as to lead us at the time to formally draw the attention of the Department thereto, there have been several causes of serious delay which were beyond our control.

The date now fixed for the entire completion of the plant is July-September, 1891, nearly two years after the contract time.

At the present time it seems probable that deliveries may be made for acceptance test as early as August, 1891, but under favorable circumstances the completed armor could hardly be ready before October 1, if then. This date may, therefore, be fixed as the earliest at which deliveries are likely to begin, and the completion of the *Maine*, the *Texas*, and the monitors is likely to be delayed accordingly. In the case of the *Maine*, a slight change has already been necessary in the design, to permit the work to go on, notwithstanding the non-delivery of the armor.

As early as July last it became evident that the first 300 tons of armor required by the Bethlehem contract would not be delivered prior to October 1, 1891, and that even after that date deliveries would be so slow as to postpone for many years the completion of the ships then authorized, if Bethlehem remained the sole reliance. To complete deliveries under the original contract at the prescribed rate requires two years; and though it is hoped that the company may be able to exceed this rate when fairly started, yet the fact is noted by the Department that 300 tons a month is the output of the largest manufactories of armor in England. At this rate the armor for ships now under construction, but not covered by the Bethlehem contract, amounting to about 14,000 tons, could not be fully delivered by this firm alone in less than six years from the present time, and the completion of ships would be

delayed accordingly. It therefore became imperative for the Government to obtain the co-operation of another manufacturer and secure, as in the case of the gun forgings, the creation of a second plant for the manufacture of armor in the United States.

Accordingly negotiations were opened with Messrs. Carnegie, Phipps & Co., the largest steel manufacturers in the United States, if not in the world, with a view to the establishment of another plant; and an agreement has been concluded with this firm for the manufacture of 6,000 tons of armor, at the same price as in the contract of 1887 with Bethlehem, to be of all steel or nickel-steel, at the option of the Department. The contract binds the firm to begin the delivery of armor in June next, and to deliver 500 tons per month thereafter.

If both companies deliver at the maximum rate called for by the contracts it will require over two years from July, 1891, to complete the manufacture of the armor required for the ships now authorized, and some of them will be ready for it in advance of the time.

In July, 1890, the attention of the Department was attracted by an address delivered by Prof. James Riley, of Glasgow, on nickel-steel, before the Iron and Steel Institute, May 8, 1889. From an examination of the extraordinary results obtained and reported by Professor Riley, the Department became convinced of the important bearing of his discoveries on the question of the manufacture of armor, a point that received some attention in the article, and the accompanying discussion. Further investigation developed the fact that experiments had already been made in England, with plates of nickel-steel from 4 to 5 inches in thickness, and others in France with somewhat thicker plates. The latter experiments had been undertaken by Messrs. Schneider, the great manufacturers of all-steel armor for the French Government, but no complete and conclusive test was known to have been made. The United States Government was, therefore, the first in the field. Although requiring 20,000 tons of armor for its new fleet, not a pound of this armor had yet been manufactured, and it was therefore in a position to apply the results of the discovery to the armor of its entire new navy, including four of the five monitors. Negotiations were immediately opened by the Department with the Messrs. Schneider which resulted in a contract for the supply of a plate of nickel-steel 6 feet by 8 in size, and 10½ inches in thickness, for purposes of experiment.

In examining the competitive tests of different kinds of armor in Europe, the Department was impressed by the fact that these tests had been largely controlled by the manufacturers who furnished the plates, and were, therefore, not fully to be relied upon as indicating comparative merits. In some cases the tests were made for the benefit of the armor, and the gun used was carefully adjusted to the armor's known capacity of resistance. Other tests, equally untrustworthy, had been directed to proving the superiority of the ordnance, and in

these the plate was adjusted with equal care to the necessities of the gun. The Department therefore determined to have a complete test, not only of the new plate, but of those varieties of armor at the time in the market and in actual use in different navies, namely, the all-steel armor of Le Creusot and the compound armor of Sheffield. Specimen plates of these makes of armor were therefore procured, and it was determined that the trials should be so conducted as to bring out the actual qualities of all the plates, and to arrive at the truth, so far as it could be ascertained by a single test.

The agents of the firms interested deprecated the use of the 8-inch gun on the ground that it would destroy all the plates, and afford no tests for comparison. As, however, the Department was now the owner of the plates, and as its object was a thorough trial which should set at rest all doubts, it was in a position to use its own tests, whatever might be the consequences to the reputation of the different kinds of armor. It was, therefore, decided to fire, first, the 6-inch gun at the corners of the plates, and subsequently to try the 8-inch gun on the center.

The trials took place at the proving ground at Annapolis September 18-22, and were in the highest degree instructive. The 6-inch gun proved to be superior to the English compound plate, which was completely perforated and practically shattered by four shots. In the case of the other two plates, the resistance of the armor was superior to the performance of the gun, and to complete the test it became necessary to use a higher caliber. The 8-inch gun was accordingly fired at all the plates, with the result that the projectile destroyed the compound plate, and broke the all-steel plate into four separate pieces, held together only by the fibers. The nickel plate, though slightly more penetrable, remained absolutely uncracked; the apertures made in it were plugged by the projectiles, and for all practical purposes of protecting a ship it was as perfect at the close of the trial as if no shot had been fired.

In view of the great superiority, shown at this trial, of the nickel plate over the others in use at the present time, Congress, at the request of the Department, made an appropriation of one million dollars, with which to purchase nickel matte. Before entering upon extensive purchases, the Department has thought it wise to make still further tests, and with this in view a limited quantity of nickel, amounting in value to about \$50,000, has been purchased. No more will be procured until complete experiments have been made.

The vice of the all-steel armor is its tendency to crack. This liability to crack at shock or perforation seems to be removed by an alloy of about 5 per cent. of nickel. The mixture enhances to a noticeable degree the qualities of elastic limit and tensile strength, leaving the percentage of elongation at a figure which makes cracking almost impossible. These qualities are precisely those necessary in armor plate. Another peculiar feature, whose bearings and causes are not yet fully ascertained, is the retention of the projectile in the aperture which it

makes in the plate. The substance of the metal appears to seize upon the projectile and hold it fast, thereby closing the very shot-hole that it opens. Striking as these characteristics are, the Department has no disposition to adopt hasty conclusions, however sensational their character, upon imperfect or inadequate trials, and proposes to continue its experiments until absolute demonstration has been reached.

In view of the special qualities which nickel steel has apparently developed in its application to armor, and of the possibility that results of equal importance may be accomplished by the employment of alloys of varying proportions for other purposes, the Department has directed the Bureau of Ordnance to institute experiments with small samples of nickel steel, varying in their composition, for the following purposes:

- (a) Construction plate similar to that used in ship-building.
- (b) Boiler plate.
- (c) Construction plate which shall be used in a comparative test with the ordinary steel plate, as to its non-fouling qualities, when used as bottom-plates of steel vessels.
- (d) Metal for projectiles.

ORDNANCE.

The following table gives the number of sets of forgings so far ordered, the number of guns completed, and the number of guns now under construction at the Washington Gun Foundry:

Caliber.	Forgings ordered.	Completed guns.	Guns under construction.
4 inch	35	4	12
5 inch	4	2	.....
6 inch	124	77	25
8 inch	35	15	3
10 inch	25	4	3
12 inch	8	.....	.....
13 inch	12	.....	.....

Of the above guns, the 4-inch and 5-inch may properly be classed as "rapid-firing guns," employing fixed ammunition, that is to say, having the cartridge-case, charge, and projectile combined in one. The 5-inch gun is the largest that present investigation and experience indicate as properly adapted to the quick-firing feature. The combined weight of the cartridge-case, charge, and projectile in this gun is estimated not to exceed 100 pounds, which can be handled without difficulty. Beyond this it is inexpedient to go, as the great weight of the projectile prevents the rapidity of fire which is this gun's essential feature. A specimen of the 4-inch gun has been completed and tried, and has given highly satisfactory results, two types, differing in their breech mechanism, having been manufactured.

The adoption of rapid-firing guns of large caliber has made it neces-

sary to develop a plant for the manufacture of suitable cartridge-cases, and an agreement has accordingly been made with the Winchester Repeating Arms Company, of New Haven, Conn., to supply 15,000 cases, with the option to the Department to order 10,000 more at a reduced price. The company has nearly completed the machinery necessary for making these cases, and their delivery will soon begin.

Passing to the heavy guns, the first is the 6-inch, the length of which has been increased from 30 to 35 calibers. The performance of the new gun is satisfactory, and specimens will soon be made with a still longer bore, a gun 40 calibers in length having been designed for this purpose.

Of the 8-inch guns, six of the new design, 35 calibers in length, have been manufactured, tested with good results, and issued, and a new 8-inch gun, 40 calibers in length, has been designed which it is proposed to mount on cruiser No. 12. The great advantage of this gun, as of all long guns, is the flat trajectory of the projectile, due to its high velocity, which makes it possible to use the gun successfully at ordinary battle range without accurate measurement of distance.

Of the 10-inch guns, four that make up the armament of the *Miantonomoh* are completed, and three of the four for the *Maine* are in an advanced stage of manufacture.

No 12-inch guns have yet been made, but forgings for one gun have been received from the Bethlehem Iron Company, and the Gun Factory is ready to proceed with the manufacture of these guns as fast as forgings are delivered.

The design for the first 13-inch gun, 35 calibers in length, has been completed, and the tools for its manufacture are in course of construction. Twelve sets of forgings of this size have been ordered from the Bethlehem Iron Company for the batteries of the three new battle-ships.

All contracts with private firms for the manufacture of heavy guns have been completed in the course of the past year, and the guns have been proved and issued to the service. No further contracts of this character will be made with private firms, the capacity of the gun foundry at Washington being sufficient to handle forgings as fast as they will be received.

The ordnance work of the past year has included the completion and installation of the armaments of the *Baltimore*, the *Philadelphia*, the *San Francisco*, and the *Miantonomoh*, while those of the *Newark* and *Concord* are ready.

The 8-inch guns of the *Charleston* are also ready, and will replace four of her 6-inch guns on her return. The manufacture of a new armament for the gunnery ship *Lancaster* has been begun. It is believed that with the increased rapidity of delivery of forgings from the Bethlehem and Midvale Companies and the development of the Washington Gun Foundry, batteries can hereafter be furnished to new ships as fast as the latter are completed. The Midvale Company is now en-

gaged in putting up a plant for forgings of large calibers and by the early part of next year will probably be able to do machining up to 10-inch guns, and to cast and forge up to 13-inch. There will, therefore, be two firms in the United States ready to supply any gun-forgings that are likely to be needed.

The improvements at the Gun Foundry during the past year include the erection of the 110-ton overhead traveling-crane, the completion of the shrinkage-pit, gun-carriage shop and office building, the construction of a railway siding from the Baltimore and Potomac railroad which has greatly facilitated deliveries and shipments, and the purchase of a shifting engine and of several special machine tools.

I desire to call particular attention to the extraordinary reduction in the cost of making guns and carriages which the Gun Factory has accomplished. The tables given below make a comparison of the average cost of the 6-inch, 8-inch, and 10-inch gun manufacture, first, under the old contracts with private firms; secondly, at the Washington Gun Factory in 1888, and finally, at the same place, in 1890, from which it appears, to take a single example, that the 8-inch guns, for manufacturing which the Government, under the old contract, paid \$8,500 per gun, aside from the cost of forgings, were manufactured by the Washington factory in 1888 for \$5,163, and in 1890 for \$2,772.

A similar reduction is to be noticed in the cost of 6-inch carriages, the average of the first ten manufactured being \$6,556, and the last ten \$2,824, a reduction chiefly in labor, as the material, though diminished in cost, has not shown a proportionate variation.

The tables are as follows:

GUNS.

Caliber.	Average cost of manufacture.		Average time of manufacture in 10-hour days	
	By contract with private firms.	Washington Gun Factory.		Washington Gun Factory.
		1888.	1890.	
6-inch	\$3,400	\$2,619	\$1,298	115
8-inch	8,500	5,163	2,772	225
10-inch		6,334	3,500	210

6-INCH CARRIAGES.

	Labor.	Material.	Total cost.
Average of—			
First 10	\$4,423.19	\$2,133.21	\$6,556.40
Second 10	3,027.41	1,283.32	4,310.73
Third 10	2,250.74	1,101.33	3,352.07
Fourth 10	1,968.05	1,314.67	3,282.72
Fifth 10	1,708.00	1,116.00	2,824.00

The act approved June 30, 1890, appropriated, for the purpose of enabling the Secretary of the Navy—

To manufacture and experimentally test, under rules and conditions to be prescribed by him, a submarine gun and projectiles for the same, \$30,000: Provided, that no part of this money shall be expended until the owners of the patents to be tested under this provision shall agree by contract to give the Government the option, within a specified time, to contract, at such price as shall be satisfactory to the Secretary of the Navy, for the exclusive right on the part of the Government to manufacture, by contract or otherwise, such submarine guns and projectiles without the payment of any royalty on the same: Provided, that such submarine gun and projectiles shall prove satisfactory, on due test, and be approved by the Secretary of the Navy.

In pursuance of this act, the Navy Department, under date of the 19th of September, 1890, entered into contract with the Ericsson Coast Defense Company for one submarine gun and six steel projectiles, the gun and projectiles to be fixed and secured in position on board the steam-vessel known as the *Destroyer*.

It is proposed to make a thorough test of this system of submarine artillery, which possesses undeniable advantages, if applied to special types of vessels, such as the ram designed for work at close quarters. The experiments will be conducted at the torpedo station at Newport.

Cast-iron common shell and shrapnel have been manufactured at Washington and supplied to the new ships as fast as needed. The manufacture of cast-steel common shell has been discontinued for the present, the results obtained not having proved satisfactory. Efforts have been made to develop in this country a process of making common shell of forged steel, as this shell possesses marked advantages, and it is hoped that before long specimens may be obtained for test and that the manufacture may be domesticated in the United States.

The specimens of armor-piercing projectiles hitherto received from private firms in this country, tempered by various processes, have not proved satisfactory, and the only present prospect of securing what we need is by the adoption of some one of the processes in use abroad. A contract has been made for a quantity of projectiles to be manufactured in America by one of these processes, and the Department is still endeavoring to bring about some arrangement by which it may obtain other armor-piercing shells of the best quality of American manufacture.

The great number of inventions, possessing more or less merit, in the way of light rapid-firing guns, has multiplied the number of types in use in all the navies of the world. The manifest disadvantage of this extreme diversity of types, each with its special ammunition, on board a single ship, has led the Department to look with favor upon a plan to limit the smaller rapid-firing pieces to the 6-pounder and 1-pounder calibers, and to abandon as fast as is practicable the 3-pounders and the 47-millimeter and 37-millimeter revolving cannon.

The Driggs Ordnance Company has begun work on the ten 6-pounder and ten 3-pounder guns and ammunition ordered last year.

The Hotchkiss Ordnance Company has filled its original contract with the Department for ninety-four Hotchkiss guns and ammunition, with the exception of steel shell for the 6-pounder and 3-pounder, in the manufacture of which, of the proper quality, considerable difficulty has been experienced. Deliveries have also been made under later orders.

TORPEDOES.

This country has been thus far absolutely without a successful auto-mobile torpedo. This fact has been referred to more or less from time to time, in reports and papers, for several years past, but it does not seem to have received the attention which its gravity demanded. Vague hopes and expectations that something would turn up gradually fixed themselves upon the Howell torpedo as the probable solution of the problem, although it was still in an experimental state. Finally, on January 5, 1889, a contract was made with the Hotchkiss Ordnance Company, the manufacturers of this weapon, for thirty torpedoes, of which ten were to be delivered by June 1, 1890, and all by September 1 of the same year. This contract has not yet been filled, owing to the loss of two torpedoes at preliminary trials and the failure of the company thus far to produce a weapon that fulfills the requirements of the contract. An extension of the contract time has been granted, and the manufacturers hold out expectations that they will be ready for another trial and for making deliveries by the 1st of January, 1891.

Notwithstanding these expectations, the necessity of possessing a practical torpedo was so great and the question whether the Hotchkiss Ordnance Company would be able to produce one answering the requirements of the contract so doubtful, that the Department would have fallen short of its duty had it not made an effort to meet, in some other way, the necessities of the situation. Negotiations have therefore been undertaken with the Whitehead Torpedo Company with a view to domesticating the manufacture of their torpedo, the most successful yet produced in the world. Favorable terms have been made and an order will shortly be placed with an American firm for a number of Whitehead torpedoes. If the Hotchkiss Company shall finally succeed in producing a torpedo to answer the necessary conditions, the two designs will be subjected to competitive tests, with a view to ascertaining the expediency of definitely adopting one or both of them for service use. In the meantime the Bureau is continuing its investigations with other designs.

Of torpedoes other than auto-mobile, one, of the Patrick design, a torpedo electrically directed from the shore, has undergone a successful test. Two others remain to be supplied to complete the three ordered February 26, 1889. It is proposed to use these torpedoes for purposes of instruction in connection with the Naval War College.

STEEL INSPECTION.

In view of the delays that have been experienced by the Department and by ship-builders engaged upon contract work, in obtaining materials, the Department invited the representatives of the principal ship-building firms on the one hand, and of steel-casting companies, rolling-mills, and manufacturers of steel forgings on the other, to a conference, which was held at the Department October 16, 1890. The statements made on both sides as to the causes of delay were full of instruction. Various causes were mentioned, most of them relating to the method of inspection, and including especially the inadequate number of the force of inspectors, the length and multiplicity of the tests, and the inflexible rules by which adherence to the letter of the specifications was exacted. In some cases objection was also raised to certain tests, among them the phosphorus and sulphur tests, but more particularly the tests for surface defects.

In order to meet the former class of objections, the Department is now taking steps to increase the force of inspectors and simplify and hasten the work of inspection, and to lay down rules of interpretation that will admit of the exercise of a reasonable judgment on the part of the inspectors. As was stated at the opening of the conference, the Department has no intention of modifying in any way the standard of steel already adopted, and it is satisfied that by the measures thus taken the causes of delay will be largely if not wholly removed.

SHIPS IN COMMISSION.

The North Atlantic squadron, under the command of Rear-Admiral Bancroft Gherardi, consists of the *Philadelphia*, *Dolphin*, *Petrel*, *Enterprise*, and *Vesuvius*, and has been occupied with American interests in West Indian and Central American waters.

The *Baltimore*, upon her first commission, relieved the *Galena* as flag-ship until July last, when she was assigned to the duty of carrying the remains of the late Captain Ericsson to Sweden; since that date the new cruiser *Philadelphia* has been the flag-ship of the squadron.

The boilers of the *Galena* and *Yantic* having become unserviceable, these ships have withdrawn from the squadron for repairs.

The *Baltimore*, having landed the remains of the late Captain Ericsson, at Stockholm, has proceeded to the Mediterranean, and is now the only vessel upon that station, the *Enterprise* having returned to the United States in July last.

The squadron of evolution, consisting of the *Chicago*, *Boston*, *Atlanta*, and *Yorktown*, under the command of Acting Rear-Admiral John G. Walker, remained in European waters until May last, when it proceeded to Brazil on a visit of compliment and friendship to that Republic, returning to New York at the end of July.

The South Atlantic squadron remained under the command of Acting

Rear-Admiral James H. Gillis, with the *Richmond* as flag-ship, until May last, when he returned to the United States. The squadron now consists of the *Pensacola*, *Essex*, and *Tallapoosa*, and is under the command of Acting Rear-Admiral William P. McCann.

The Pacific squadron consists of the *Charleston*, *Mohican*, *Iroquois*, and *Ranger*, under the command of Acting Rear-Admiral George Brown, and has been looking after the interests of the Government in the waters of the Hawaiian and Samoan Islands. The *Alert*, *Nipsic*, *Adams*, and store-ship *Monongahela* have been put out of commission for necessary repairs.

The Asiatic squadron consists of the *Omaha*, *Swatara*, *Monocacy* and *Alliance*, under the command of Rear Admiral George E. Belknap. The *Marion* returned to the United States in May last, and was put out of commission at the Mare Island navy-yard for repairs.

The *Pinta* has continued on special duty in Alaskan waters, the *Michigan*, upon the Lakes, the *Despatch* and *Fortune* upon our coast, and the *Thetis* on surveying duty in the Pacific. The scarcity of vessels on the Pacific station made it necessary to withdraw the *Rango* from surveying duty and assign her to the Pacific station, where she has been employed, part of the time in company with the *Thetis*, in the waters on the west coast of Central America.

The training squadron, consisting of the *Jamestown* and *Portsmouth*, has made the usual cruise in the West Indies and Europe.

PERSONNEL.

The number of rear-admirals is too small for the needs of the service, and I recommend that it be increased from six to ten.

Of the reductions made in the numbers of the naval personnel, by the acts of Congress of July 15, 1870, and August 5, 1882, the first was adopted at a time when the material of the Navy was in a state of rapid decline, both in the number and quality of ships, and the second when it had touched the lowest point. The transformation and rapid development of the fleet which has taken place in the last six years, make it absolutely necessary to call for a new adjustment in certain branches of the personnel, in order to keep up a reasonable standard of efficiency among the officers of the Navy.

The situation of the lower part of the list of line officers from the grades of lieutenant to ensign is so serious as to be little less than alarming. At the present rate of promotion these officers bid fair to pass their lives in the junior grades. The average age of the five officers now at the head of the list in each of these grades is as follows:

	A. M.
Lieutenant.....	41 1
Lieutenant, junior grade.....	31 5
Ensign.....	22 7

This is bad enough, but the situation during the next few years is growing rapidly worse, and actual calculation shows that, at the aver-

age rate of promotion, the officers now at the foot of these three grades will only be promoted out of their grades at the following ages:

	Years
Lieutenant	64
Lieutenant, junior grade	37
Ensign	33

The spectacle will thus be presented, at a time not very far distant, of the whole grade of lieutenants in the Navy composed of men between the ages of thirty-seven and fifty-four. During all this period they can only have a subordinate responsibility, although they have reached an age when many men are almost ready to retire from the pursuit of an active career. They are still in leading-strings, always compelled to refer even unimportant questions to their seniors, dragging out the miserable existence of a subordinate whose energies have been sapped, whose ambition is gone, and who has learned from long experience to evade and shirk responsibility.

The absurdity of this arrangement is shown by the fact that after spending forty years of his life in inferior positions the lieutenant has but eight years left in which to pass through the highest grades before retirement. When he reaches a position of responsibility he is no longer fitted for it, and he is, therefore, as incapacitated for efficient service during his short period of command as he was during his protracted career of subordination. If this practice continues, the Government will soon find itself possessed of a fleet of the highest qualities placed in the hands of a body of officers originally inferior to none in the world, but with a capacity that has been dwarfed and stunted by the results of this restrictive legislation.

As a partial remedy the Department proposes that the number of lieutenant-commanders be increased from 74 to 124, and the number of lieutenants be diminished in like proportion; and that the number of lieutenants of the junior grade and of ensigns be more nearly equalized.

In connection with this subject I would strongly urge that the bill (S. 540) now pending in Congress to amend the statutes relating to the naming, rating, and command of vessels be so amended that second rates may be commanded by captains or commanders, third rates by commanders or lieutenant-commanders, and fourth rates by lieutenants; thus obviating the hardships which the bill in its present shape would impose upon junior officers.

PERSONNEL—ENGINEER CORPS.

Of equal importance with the above changes is the demand for an increase in the numbers of the Engineer Corps. At present there are not enough engineer officers in the Navy for ordinary working purposes, and if no additional ships were building an enlargement of the corps would be necessary. The important additions that are now being made to the fleet emphasize still further the urgent necessity of immediate

action. The engines of the new ships, with their great complexity and delicate adjustment, require the highest kind of expert treatment, and unless a sufficient force is provided the safety of the ships will be seriously endangered. A bill for this purpose has been introduced in Congress, which provides also for the selection of a certain number of graduates of technical schools for appointment in the Engineer Corps. With the general principles underlying this bill the Department heartily concurs, and it earnestly asks that action may be taken upon it at the coming session.

NAVAL MILITIA.

One of the most vital defects in our present naval system is the want of an organized militia, so trained that in case of necessity it will be prepared to supply the demands of the naval service. The number of seamen now allowed by law is 7,500. Most of them at any given time are necessarily scattered. They would not be available at all in an emergency, nor would they in any case be numerous enough to form more than the nucleus of an active force.

At the outbreak of the civil war there were only two hundred seamen on the Atlantic coast at the disposal of the Government for the crews of ships fitting out. Largely in consequence of this, naval operations during the first six months were delayed and obstructed. The necessities of war afterwards increased the force to fifty thousand. Most of the new recruits were destitute of naval training, and to obtain even these it was necessary to pay heavy bounties.

The want of a supply of men in reserve, places the Navy at a great disadvantage as compared with the Army. The Army has always behind it a well-trained militia, which makes its real numerical strength. Without this it would be a feeble instrument of national defense. The Navy needs its reserves as much as the Army, and they should be composed not only of trained seamen, but of trained naval seamen.

The development of the militia is in the interest of a true economy. Its cost to the General Government lies only in arms and equipment for training. The remainder of the expense is voluntarily borne by the States. Compared with the cost of a regular force of the same size this expense is little more than nominal, as the periods of active employment are confined to what is required for training purposes alone.

It is the true American principle that the standing forces of the Government, military or naval, should be kept on the smallest possible footing consistent with the requirements of defense. But it is essential to the maintenance of this principle that there should be a body of trained citizens back of the small standing force which will be ready to meet an emergency. The United States has no use for a large body of men, drawn away from productive labor and consuming their time in a permanent army or navy, but it requires that provision should be made for recruiting both branches of the service in case of necessity directly from the people.

Until recently no steps have been taken towards the creation of a naval militia; but within the last two years an active interest in the subject has developed itself, not only on the seaboard, but on the interior waters and on the Pacific, and a spontaneous movement has taken shape in the passage by several States of acts for the establishment of a naval militia. In some cases successful organizations have been already formed, and all that is required is such action on the part of the General Government as will put the naval militia on the same footing as the land militia, namely, the issue of arms and equipments. Other States are tending in the same direction in response to an active popular demand, and there is every reason to believe that with proper encouragement from the Department, and no other action by Congress than an appropriation for the supply of arms, the creation of a naval militia will be assured.

It is clearly in the interest of sound policy that a demand of this kind springing directly from the people and closely concerning them, should meet with a hearty co-operation on the part of the Government, and that a general disposition thus aroused and expressed should not be suffered to die from delays and discouragement. The naval militia of the country now actually in existence should be put on the same footing as the land militia. A bill with this object was introduced at the last session of Congress, and I earnestly recommend its passage.

The naval militia organization in New York has been permitted to drill on board the *Minnesota*, and the organization in Boston on board the *Wabash*. The latter drill lasted several days, and was equivalent to the annual encampment of the land militia. Landing and boat drills also took place at selected points in the neighborhood of Boston, and the organization developed a high degree of spirit and energy in its members.

In connection with the subject of a naval militia, I would call attention to the advantage of providing a place in its ranks for persons of special acquirements demanded by the naval service, but of a character somewhat outside of the ordinary scope of professional training. The extensive employment of electricity in its applications on ship-board makes it necessary for naval officers to acquire a certain amount of electrical knowledge, but it is impossible for all, or even for any great number of them, to become expert electricians, nor is it desirable that they should do so at the expense of other branches of their profession of more pressing importance. To meet this want, it is suggested that a corps of naval electricians be established in the different States that have created a naval militia, to be attached to this militia and to receive the naval training which it is the great object of the militia to give.

By this means a corps of electrical specialists would be organized, familiar with the needs and usages of the naval service, and the extended applications of electricity to naval vessels would be rapidly de-

veloped in time of peace as well as in war. In the latter contingency the corps would be especially valuable in fitting out new vessels with electrical apparatus, and in taking charge of the electrical plant on board ships in commission. The number of officers available in an emergency would thus be increased, as those now detailed to electrical work could be assigned to other duties, and their work could be carried on by the experts of the naval militia.

ESTIMATES AND APPROPRIATIONS.

The general estimates for the support of the Navy, including public works, and of the Marine Corps, have been cut down to the lowest possible point, and show a total of \$1,352,594.56 less than the estimates of last year and \$155,876.30 less than the appropriations for the current year.

On the other hand, the estimates for increase of the Navy show an enlargement far beyond that which has taken place in any prior year. The estimates for this purpose for the year ending June 30, 1891, were \$9,386,500; the estimates for the current year are \$18,471,229, or nearly double the amount. By far the largest part of this increase is for payments upon outstanding contracts.

The appropriations under this head for the current year fell short of the amount estimated therefor by \$1,266,500. The appropriations as well as the estimates were doubtless based on the supposition that at the ordinary rate of progress in naval construction the reduced amount would be sufficient, and that the ships newly authorized would require nothing during the current year. As a result, the appropriation will undoubtedly fall short by about \$1,600,000 of the amounts required to continue the work of construction now in progress. This amount, which is properly a deficiency charge upon the appropriation for the current year, should be deducted from the total estimate named above, leaving the amount under increase of the Navy properly chargeable to 1892, \$16,871,229, as against an appropriation for the current year (including the above deficiency) of \$9,720,000.

Partly in explanation of these figures, and partly as a fact in itself worthy of the most careful study and application, the Department would call attention to the practice which has obtained hitherto in the building of new ships, of authorizing construction without making any provision for payment beyond that which the calculations for the coming year show to be immediately necessary, and generally with the assumption that during the first year after a ship is authorized no payments will be required. Thus the act of June 30, 1890, authorized the Department to undertake immediately the construction of three great battle-ships, one protected cruiser, one torpedo cruiser and one torpedo boat, and defined approximately the total cost of the vessels by fixing a limit, but made no appropriation therefor, upon the assumption that no work would be done before July, 1891. It surely could not be the in-

tention of Congress that the Department was to protract and delay the construction of these authorized vessels until a new year should have furnished new estimates for appropriations to cover their cost; nor need it offer any apology for its promptitude, in beginning the construction of these vessels, under the authority given by the statute, within three months after they were authorized.

The result of this system, of neglecting when contracting an indebtedness to provide for paying the bills, is shown in the estimates for the coming fiscal year. Owing to the large accumulation of vessels uncompleted, some of them not yet begun, which the present administration of the department found in March, 1889, awaiting its action, together with a number of large vessels authorized in the act of last summer, all of which have been got under way, an immense banking up of contract work in the fiscal year 1892 has taken place for which Congress is now called upon to appropriate. Some of these vessels were authorized by acts as early as 1886, others in 1887, 1888, and 1889. The monitors belong to a still earlier period. Had the Congresses, which authorized the vessels now under construction, appropriated the money to pay for them at the time they were authorized, neither the estimates nor the appropriations for the coming year would have shown any increase whatever.

It must be remembered that the money appropriated for increase of the Navy is only drawn from the Treasury as the progress of the work, carried on under contract or at the yards, calls for its payment. Until that time it remains untouched. The appropriation for the construction of ships at the time of their authorization would thus make no alteration in the drafts upon the revenues, while the Department would be able to proceed with its work in the full assurance that the balances to its credit are sufficient for meeting its obligations.

Comparative exhibit of estimates and appropriations, 1891 and 1892.

Detailed objects of expenditure, and explanations.	Estimates, 1891.	Appropriations, 1891.	Estimates, 1892.	
General establishment:				
Pay of the Navy.....	\$7,666,312.00	\$7,250,000.00	\$7,314,742.00	
Pay miscellaneous.....	240,000.00	240,000.00	240,000.00	
Contingent, Navy.....	7,000.00	7,000.00	7,000.00	\$7,561,742.00
Bureau of Yards and Docks:				
Ordinary expenses.....	488,681.32	627,191.64	602,606.89	
Public works.....	1,308,755.00	797,930.00	623,376.13	1,715,082.02
Bureau of Navigation:				
Ordinary expenses.....	164,900.00	117,250.00	135,750.00	
Naval Academy.....	281,617.45	230,017.45	213,065.45	340,715.45
Bureau of Equipment.....	1,128,625.00	951,025.00		1,914,650.00
Bureau of Ordnance.....	279,224.00	378,624.00		400,041.75
Bureau of Construction.....	1,194,972.50	1,319,972.50		1,619,972.50

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Comparative exhibit of estimates and appropriations, 1891 and 1892—Continued.

Detailed objects of expenditure, and explanation.	Estimates, 1891.	Appropriations, 1891.	Estimates, 1892.	
Bureau of Steam Engineering	\$1,000,070.00	\$827,900.00	.....	\$789,105.00
Bureau of Provisions and Clothing..	1,350,302.53	1,183,532.03	.....	1,242,572.03
Bureau of Medicine and Surgery	159,500.00	138,600.00	.....	140,500.00
Marine Corps:				
Pay Department.....	697,492.27	687,471.79	\$707,725.01	
Quartermaster's Department	253,811.72	250,611.72	308,818.97	
				1,016,543.98
Total running expenses.....	16,212,733.79	15,016,035.53	.....	14,860,159.23
<i>Increase of the Navy.</i>				
Bureau of Yards and Docks.....	.....	.....	200,000.00	
Bureau of Equipment.....	.....	.....	400,000.00	
Bureau of Ordnance	4,286,500.00	2,645,000.00	4,158,850.00	
Bureau of Construction and Repair..	4,000,000.00	5,475,000.00	8,835,433.00	
Bureau of Steam Engineering.....	1,120,000.00	.....	4,856,948.00	
				18,471,229.00
Total increase of Navy	9,386,500.00	8,120,000.00	.....
Grand total.....	25,599,233.79	23,136,035.53	.....	33,331,388.23

Appropriations, expenditure, and balances, fiscal year ending June 30, 1890.

	Appropriations for fiscal year ending June 30, 1890.	Amount drawn fiscal year ending June 30, 1890.	Balances undrawn June 30, 1890.	Balances undrawn October 31, 1890.
Pay of the Navy.....	\$7,250,000.00	\$6,137,490.72	\$1,112,509.28	\$851,300.90
Pay, miscellaneous.....	225,000.00	210,099.87	5,000.13	6,633.74
Contingent, Navy.....	7,000.00	3,870.28	3,129.72	2,091.46
Marine Corps:				
Pay of the Marine Corps.....	685,708.35	506,317.98	89,390.37	69,978.90
Provisions	63,863.25	93,863.25		
Provisions, deficiency, appropriated by act September 30, 1890	754.39	.....	
Clothing	65,000.00	64,809.35	190.65	3,140.83
Clothing, deficiency, appropriated by act September 30, 1890.....	9,927.00	.....	
Fuel	18,000.00	17,975.85	24.15	2,464.02
Fuel, deficiency, appropriated by act September 30, 1890	3,330.12	.....	
Military stores.....	12,000.00	11,984.16	15.84	15.84
Transportation and recruiting.....	10,000.00	9,976.74	23.26	515.59
Transportation and recruiting, deficiency, appropriated by act September 30, 1890.....	500.00	.....	
Repairs of barracks.....	16,780.00	16,767.09	12.91	
Forage	3,500.00	3,500.00		
Forage (deficiency, appropriated by act September 30, 1890).....	317.80	.....	
Hire of quarters.....	6,624.00	6,564.00	60.00	60.00
Contingent	27,500.00	27,360.19	139.81	90.00
Contingent (deficiency, appropriated by act September 30, 1890)	2,968.71	.....	

Appropriations, expenditures, and balances, fiscal year ending June 30, 1890—Continued.

	Appropriations for fiscal year ending June 30, 1890.	Amount drawn fiscal year end- ing June 30, 1890.	Balance un- drawn June 30, 1890.	Balance un- drawn June 30, 1890.
Naval Academy:				
Pay, Naval Academy	\$164,013.45	\$163,157.85	\$855.60	\$855.60
Special courses	5,000.00	2,100.41	2,899.59	2,899.59
Repairs	21,000.00	18,731.17	2,268.83	2.44
Heating and lighting	17,000.00	15,744.61	1,255.39	61.77
Furniture for cadets' quarters	2,500.00	2,499.92	.08	.08
Contingent	43,800.00	37,402.41	4,397.59	858.00
Navigation and navigation supplies	100,000.00	75,340.54	24,659.46	5,907.15
Civil establishment, Navigation	0,000.00	8,737.49	242.51	237.32
Contingent, Navigation	5,000.00	3,614.90	1,385.10	215.01
Ordnance and Ordnance Stores	141,000.00	130,082.01	10,917.99	8,794.15
Ordnance:				
Repairs	15,000.00	8,941.77	6,058.23	3,087.00
Civil establishment	24,525.00	20,998.66	3,526.34	2,526.34
Contingent	8,000.00	5,807.73	2,192.27	.66
Torpedo Corps and War College	75,000.00	53,806.15	21,193.85	8,470.57
Equipment of Vessels (deficiency, ap- propriated by act September 30, 1890)	675,000.00	354,920.64	320,079.36	112,940.00
Transportation and Recruiting, Equip- ment and Recruiting	30,000.00	29,494.00	505.94	2,645.23
Transportation and Recruiting, Equip- ment and Recruiting (deficiency, ap- propriated by act September 30, 1890)	1,632.53			
Civil establishment, Equipment and Re- cruiting	11,525.00	11,534.87	.12	.38
Contingent, Equipment and Recruiting	15,000.00	0,594.67	5,405.33	2,811.90
Naval Training Station, Coasters' Harbor Island, R. I.				
Maintenance, Yards and Docks	20,000.00	15,726.26	4,273.74	2,374.01
Civil establishment, Yards and Docks	103,000.00	143,113.86	21,856.14	8,180.01
Contingent, Yards and Docks	40,754.00	40,606.79	227.81	200.35
Repairs and Preservation at Navy Yards	20,000.00	8,449.26	10,550.74	10,476.12
Naval Home, Philadelphia, Pa.	225,000.00	203,847.47	21,152.53	7,373.66
Medical Department	08,517.00	57,440.91	11,076.09	698.44
Naval Hospital Fund	57,500.00	53,577.40	3,922.60	2,087.03
Naval Hospital Fund	20,000.00	20,000.00		
Repairs, Medicine and Surgery	20,000.00	19,258.15	741.85	400.00
Contingent, Medicine and Surgery	25,000.00	20,370.14	4,629.86	631.90
Provisions, Navy	1,055,000.00	925,573.39	129,426.61	2,400.02
Civil establishment, Provisions and Clothing	66,510.03	66,073.08	436.95	628.55
Contingent, Provisions and Clothing	40,000.00	28,580.03	11,419.97	0,862.60
Construction and Repair	1000,000.00	774,087.57	225,912.43	30,047.16
Civil establishment, Construction and Repair	10,072.50	10,737.82	234.68	234.73
Steam Machinery	605,000.00	517,648.46	87,351.54	25,075.81
Civil establishment, Steam Engineering	17,000.00	16,728.36	271.64	271.48
Contingent, Steam Engineering	1,000.00	680.64	319.36	46.11
Total	15,180,044.03	11,011,288.95	2,058,304.23	1,197,406.49

* Including \$6,000 for deficiency appropriated by act April 4, 1890.

† Including \$50,000 for deficiency appropriated by act April 4, 1890.

As will be seen from the foregoing exhibit—

The amount of appropriations for the current expenses of the fiscal year 1890, including \$6,000 for Naval Training Station, Coaster's Harbor Island, Rhode Island, and \$50,000, Construction and Repair, appropriated by act of April 4, 1890 was June 30, 1890.....		\$13,069,593.18
Appropriated by act of September 30, 1890.....		119,450.85
		13,189,044.03
Amount of appropriations June 30, 1890		13,069,593.18
Drawn by requisition to June 30, 1890.....		11,011,288.95
Balance undrawn July 1, 1890.....		2,058,304.23
Appropriated by act of September 30, 1890.....		119,450.85
		2,177,755.08
Drawn by requisition from July 1, to October 31, 1890		980,258.59
Balance undrawn November 1, 1890		1,197,496.49
In hands of pay officers November 1, 1890.....		9,929.23
		1,207,425.72
Due from pay of the Navy to officers and men.....		\$714,921.93
Due from pay of the Marine Corps to officers and men..		46,596.02
Due from equipment of vessels.....		50,000.00
Due from construction and repair.....		30,000.00
Due from steam machinery.....		20,000.00
Due from other appropriations		42,205.77
Due to clothing, Navy		109,710.69
Due to small-stores fund.....		31,737.23
		1,045,171.64
Available balance.....		152,254.08

SALES OF GOVERNMENT PROPERTY, AND MISCELLANEOUS RECEIPTS.

A statement, prepared in the office of the Fourth Auditor of the Treasury, will be found in the appendix, which shows in detail the receipts, from November 1, 1889, to November 1, 1890, from sales of condemned property belonging to the Navy and the Marine Corps, from sales of supplies and materials to other departments of the Government and to persons in the service, from rents of wharves and grounds, and as interest and gains on exchange. The total amount so received was \$85,691.02, of which \$47,083.54 reverted to the appropriations from which the supplies and material were drawn, and \$38,607.48 were covered into the Treasury as "miscellaneous receipts," in accordance with law.

In addition to those mentioned in the last annual report of this Department, the following vessels have been surveyed and condemned as unfit for further use in the Navy, and in pursuance of the act of August 5, 1832, their names have been stricken from the Navy Register: The *Brooklyn*, at Norfolk, and the *Saugus* and *Rescue*, at Washington. It is proposed at an early day to offer for sale such vessels as have been stricken from the Navy Register as it may be deemed advisable to dispose of in that way.

DRY-DOCK COMMISSIONS.

In the annual report of last year the Department dwelt upon the extreme necessity of a navy-yard or dry-dock on the northwest coast, and also upon the Gulf. This necessity remains as great as ever. The naval appropriation act approved June 30, 1890, required the President to appoint a commission composed of two competent naval officers, one competent army officer, and two competent persons from civil life, whose duty it should be to select a suitable site, having due regard to commercial and naval interests, for a dry-dock at some point on the shores of the Pacific Ocean, or the waters connected therewith, north of the parallel of latitude marking the northern boundary of California, including the waters of Puget Sound, and also Lakes Union and Washington, in the State of Washington. An executive order of September 6, 1890, designated, in pursuance of this law, the following named persons as members of the commission: Capt. T. O. Selfridge, U. S. Navy, president; Col. George H. Mendell, U. S. Army; Hon. T. C. Platt, of New York; Hon. Richard W. Thompson, of Indiana; and Lieut. A. B. Wyckoff, U. S. Navy. The commission met at Tacoma, Wash., October 1. It is understood to have completed its examination, but has not yet handed in a report.

By the same act the President was required to appoint a commission, to be similarly constituted, to select a suitable site, having due regard to commercial and naval interests, for a dry-dock at some point on the shores of the Gulf of Mexico or the waters connected therewith. In the case of both commissions, the act provides that if private lands are selected for a site, the commission is to estimate its value and ascertain as nearly as practicable the cost for which it could be purchased or acquired, and make full and detailed report to the President for transmission with his recommendation to Congress.

An executive order of November 22 designated the following named persons as members of the Gulf Commission: Capt. F. M. Bunce, U. S. Navy, president; Col. C. B. Comstock, Corps of Engineers, U. S. Army; Hon. Sidney Perham, of Maine; Hon. David T. Littler, of Illinois; and Lieut. R. M. G. Brown, U. S. Navy.

The commission will be organized without delay and proceed to carry out the work prescribed by the statute.

REVENUE MARINE SERVICE.

The Department renews its recommendation, made last year, that an act be passed consolidating the Revenue Marine Service with the Navy. The advantages of this change to both branches of the service have been repeatedly pointed out, and it is not necessary to dwell upon it again. No substantial objection has been advanced which counterbalances the great advantages to be derived from the measure. The act now before Congress, which has passed the House, has been carefully drawn, and the Department earnestly recommends its passage.

INCREASE OF THE NAVY.

The aim of the Navy Department during the last year in carrying out the provisions of law in reference to the increase of the Navy requires little description further than that which has been already given. It is the aim that was adopted and steadily pursued during the early years of our naval history; to build ships of various types for various purposes, each one of which should be the best of her type in existence. The objects to be attained in the battle ships, in the *New York*, in No. 6, in No. 12, and in the torpedo cruiser, are distinct and well defined, and it is believed that, taken as a whole, they point out, with a clearness that can not be mistaken, the true policy of naval construction which this country should adopt to meet the demands that exist to-day. It is safe to say that, in the present state of information on this subject, no mistake can be made in duplicating one of these types.

In the sea-going coast-line battle ships, the United States possesses three vessels, which, though few in number and of less displacement than the monsters now building in Europe, are as powerful as any battle ships in the world. In my report of last year I stated that, in my opinion, twenty ships of this class were required adequately to protect the two coasts of the United States. Such, however, is the great power, both offensive and defensive, of the design evolved during the past year that the Department may safely modify its previous figure. There is no doubt that twelve such battle ships as are now in course of construction would equal in efficiency for our purposes the twenty that were then contemplated, and with a suitable proportion of harbor-defence ships, cruisers, and gun boats, would put the coasts of the United States in a position where they might be free from all anxiety as to the consequences of attack from abroad.

In building any new armored ships that may now be authorized, whether battle ships or harbor defenders, the Department will be free from all those apprehensions as to the failure of the armor supply from which it has hitherto suffered. Not only will the mills whose plant is now approaching completion be able to meet the wants of ships hereafter projected by the time the latter need their armor, but if such ships were now authorized the manufacturers would be justified in increasing their plant to such an extent as to advance the rate of production already contracted for. The demand would bring about a supply, as has already been the case with the three battle ships and as would have been the case to a still larger extent if the number of battle ships authorized last summer had been greater.

It appears, therefore, that the building of battle ships will not be obstructed by the want of armor. As far as other material and the necessary work thereon are concerned, including design and construction both of ships and of engines, the Department was never more favorably situated for carrying on operations than at the present time.

Whatever line of construction Congress should now deem it best to follow up, the Department would draw especial attention to the necessities of the most vulnerable points along the coast, with a view of providing, as far as possible, for the protection of the enormous interests at stake in those localities. The stretch of coast from Fortress Monroe to Boston contains four large cities, one of them a vast aggregation of cities, the storehouses of national wealth, which to-day is entirely accessible to an enemy. The defense of these four commercial seaports is a problem of vital interest to the whole United States. The States of Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia are perhaps nearest to the danger, but a danger that threatens the coast and seaports of these States is a danger to the whole country. Any measure upon which these localities unite Congress could not fail to adopt.

There is no other instance in the world at the present time of so much wealth in so exposed a situation. To protect it requires a combination of guns afloat and guns on land. Especially at that angle made by the shores of New England and New Jersey, the junction of internal and external lines of communication, where so much of the world's commerce centers, should every reasonable precaution be taken to prevent the entrance of a hostile force. The peculiar configuration of Long Island Sound, with the harbors and bays affording shelter in its neighborhood, the whole forming a highly advantageous base of operations for a maritime assailant, is such that no enemy's fleet should ever be allowed to gain an entrance therein.

The harbor of New York at the present time is entirely defenseless. The forts at the Narrows would offer no obstruction to the entrance of a fleet. Any vessel, whatever her size or character, armed with the modern 8-inch guns—which, be it remembered, are far from being the heaviest guns afloat—could lie out of range of the forts and destroy them. As for Long Island Sound, it has no forts worthy of the name, and the entrance to the East River by that route is as unobstructed as the Narrows. It may be said that guns could be mounted on shore to fire at such a fleet. The Army possesses no modern guns for the purpose, and the cast-iron shell from the guns now in its possession would make no more impression on modern ironclads than hail-stones on a roof. It is likewise thought by those who are ignorant of the actual conditions that torpedoes would prevent the entrance of the fleet. The fact is, we have no torpedoes. Stationary torpedoes or mines, indeed, we have, or could make and lay in abundance, but an attacking fleet could pick them up or countermine without danger to itself, leaving a clear path for its ships. Of automobile torpedoes, which, though not a principal means of defense, would yet be a contributing factor, we have not one at the present time. As for our unprotected cruisers, if they staid in port, it would only be to become involved in a general capit-

sation. There is nothing, therefore, to prevent the access of a fleet to New York by either the eastern or the southern entrance.

With a fleet once in the harbor the consequences would be of such magnitude that the country at large could not disregard them. The popular impression is that the danger of a sea-coast city is a danger of bombardment, with ransom as an alternative. It is not regarded as a pressing danger, being opposed to the civilized tendencies of the age, and, at the worst, a menace that can be bought off. Leaving out, however, the possibility, if such a possibility exists, that a state at war will forego an overwhelming strategic advantage out of deference to the "civilized tendencies of the age," and that any State or city is rich enough to pay the fifty or one hundred millions that may be exacted as the price of immunity, the danger does not stop here. The terms of ransom would undoubtedly include the surrender of all the shipping, naval or mercantile, in the port. In the case of New York, it is hard to say what limit would be fixed to a ransom, and Brooklyn and Jersey City would contribute their shares.

But the calamity would not end with the payment of money and the surrender of ships. An enemy's fleet once in the waters of New York would remain there. Commerce would be annihilated. Communication would be absolutely cut off. The ferryboats would cease to run. The Brooklyn Bridge would be closed to traffic as the condition of its preservation. Finally, the railroad communications would be cut and the food supply of two and one-half millions of people would come to an end. Capitalists might afford to pay a ransom, but famine would fall first on the homes of the poor. The ransom paid by that population would be anything which it was in their power to give, and which the fleet in the harbor would accept as the price for its departure.

If any one fancies that this is an overdrawn picture, let him make a simple calculation of the amount of food daily required by two and one-half millions of people. Taking the Navy ration, a fair allowance of the food that will support an adult man during twenty-four hours, and making a proper deduction for women and children, it appears that there is consumed daily in New York and Brooklyn:

	Pounds.
Bread	1,575,000
Vegetables.....	1,575,000
Meat	1,350,000
Butter	225,000
Coffee	225,000
Sugar	450,000

This amount or its equivalent must as an average be received daily in the two cities from outside. Whatever the quantity on hand for consumption, or stored for exportation, it would soon be exhausted by such a drain when additions to the stock had ceased; and it must be remembered that all the elevators and many of the store houses containing the supply are on the water front, and not a few of them on the

wrong side of the river. Those who recall the scarcity caused by the snow blockade in the great storm of March, 1887, may form some idea of the effect of absolute stoppage of communication. Starvation would be only a question of days.

The present statement is revealing no secret; at least no secret to foreign States. It is only our own people who ignore it. The facts are patent upon the charts of our own Coast Survey—charts upon which every channel on the water and every topographical detail on the land are plotted with fatal accuracy—and which any one, American or foreigner, has for years been able to have for the asking.

No land force, however numerous or resolute, could prevent the result I have described. Our present naval force would be equally powerless. Even when all the ships now authorized are completed we should not have a fighting chance against a respectable fleet of foreign ironclads. There are other seaboard cities besides the Atlantic exposed to attack, other cities besides New York of commercial importance—New Orleans on the Gulf, San Francisco and Tacoma and Seattle on the Pacific. Our line of defense is long, and its parts are so divided and so remote that they could not be included in any single plan of concerted operations. Each would inevitably become the object of separate attack, and each must be effectively and separately guarded. Nothing short of a force of battle ships, numerous enough to be distributed in the separate fields of attack and able to concentrate on any threatened point within their own field, will prove a complete protection.

In my previous report, in addition to the battle-ships, I suggested a force of powerful harbor-defense vessels for the specific protection of these exposed localities. Congress, as it seems to me, with great judgment, applied its important increase of last year to the most pressing necessity—that of battle-ships, and the Department endeavored, to the best of its ability, to meet the call that was made upon it with promptness and in accordance with the demands of existing naval warfare. Both battle-ships and harbor-defenders are still far too few in number to meet the urgent necessities of the situation.

The type of ship which the Department would suggest for purely local purposes is an enlarged *Puritan*, of light draught, not more than 14 to 16 feet, of moderate speed, and intended absolutely for smooth-water cruising, but with such armor and armament as to make it, at the same time, irresistible and invulnerable against any single assailant. Twenty inches of armor and eight 13-inch guns would fulfill the prescribed conditions. It is a serious question, however, whether greater advantages would not be gained by distributing the guns in two vessels instead of one; but whichever plan is adopted, the general conditions of the problem remain the same. The ships would be intended exclusively for local purposes, and would have a post and a station from which they would never be absent. While the battle-ships are of the first importance to concentrate along the coast, or in waters not

far removed from it, wherever they may be needed, the continuous presence of a sufficient number of harbor-defense vessels would stay the entrance of an enemy until the battle ships could arrive. The type of harbor-defense ship described is less expensive than the sea-going ships, and it answers, as no other type can answer, the requirements of American harbors.

Should such a line of construction be adopted, the vessels so built should be regarded as distinctively for local protection. The movement towards the creation of a naval militia, which has found expression in the legislation of four States—Massachusetts, Rhode Island, New York, and Pennsylvania—would receive additional strength and encouragement from the creation of this national force reserved for local purposes. The harbor-defense ship would become the rallying point, the armory, the drill-hall, the parade ground, and the naval school of those young men who have shown such spirit and earnestness in the organization of the naval militia. It should be their privilege to become the principal source of supply for the complement, both of officers and men, of their local ship; and the result would be an addition of incalculable strength to the naval resources of the country.

If such a plan should be adopted it is reasonable to believe that Boston, New York, Philadelphia, Baltimore, New Orleans, San Francisco, and the cities on Puget Sound would become centers of naval strength instead of being, as they are to-day, conspicuous examples of maritime weakness, and inviting objects of maritime attack; while these local forces, organized in complete harmony with the spirit of American institutions, would be welded together and transfused with the spirit of naval discipline by the small but efficient standing force which the country will always maintain.

In conclusion I would repeat here the proposition that was laid down at the opening of my report last year, that "the purpose for which the United States maintains a Navy is not conquest, but defense." The best guaranty of peace is a judicious expenditure for the Navy, such as will meet the necessities of the country. At the present time it has not such a force, nor will it have the force required even when all the ships now authorized are completed. The problem of naval construction has been simplified almost beyond belief in the last eight years. It only remains to add to the number of vessels of types already in existence.

The price is not too high to pay if it affords the means whereby the United States, for the first time in many years, may be enabled to preserve and defend its rights. War is a great calamity, but it is not the greatest calamity that can befall a free, intelligent, and self-respecting people.

B. F. TRACY,
Secretary of the Navy.

PAPERS

ACCOMPANYING

THE REPORT OF SECRETARY OF THE NAVY.

REPORT OF THE CHIEF OF THE BUREAU OF YARDS AND DOCKS.

.

INCREASE OF THE NAVY.

The new battle-ships *Maine* and *Texas* will have to be armor-plated in the dry-docks, in the interests of economy and safety, it being better to lower heavy plates than to hoist them. This will necessitate two traveling cranes for each dock at New York and Norfolk, four in all, of a capacity of about 40 tons each, the estimated cost of which is \$200,000.

As it is expected that plates will be delivered by the summer of 1891 this money should be appropriated at once, under head "Increase of the Navy," so that there may be no delay.

It is very probable that it will be advantageous to the Government to use its docks to armor the vessels built by contract.

I renew very earnestly the recommendation of my predecessor that the salary of the chief clerk of this Bureau be raised to \$2,250. The present incumbent has been more than thirty-three years in this Bureau; his services are invaluable, and this increase is due a faithful servant of the Government.

The disbursements of this Bureau, over which he keeps supervision, are very large, and his watchful care in that direction has resulted in there never being a deficiency. Besides this and other important duties he conducts the correspondence, which is large and varied, requiring a man of superiority and ability.

Very respectfully, your obedient servant,

N. H. FARQUHAR,
Chief of Bureau.

HOB. B. F. TRACY,
Secretary of the Navy.

REPORT OF THE BOARD OF VISITORS.

UNITED STATES NAVAL ACADEMY,
Annapolis, Md., June 6, 1890.

SIR: The Board convened on the 2d instant and organized by the election of Rear-Admiral L. A. Kimberly, U. S. Navy, president, and Senator J. C. S. Blackburn, vice-president. Lieut. R. Wainwright reported as secretary, having been detailed for that duty by the superintendent of the Academy. Hon. William A. Northcott was elected orator.

The various committees were then appointed by the president of the Board, and were requested to submit their reports as early as practicable.

The Board of Visitors beg leave to submit the following report as the result of its observations during its stay at the Naval Academy:

CONDITIONS OF ADMISSION TO AND DISCHARGE FROM THE ACADEMY.

The Board concurs in the recommendation made by previous Boards, that the age of admission be fixed from fifteen to eighteen years, instead of fifteen to twenty years as at present.

It is believed that comparative equality of age in the different classes would have a beneficial effect in the personnel of the classes, while wide discrepancy of age in the same class has a detrimental effect. Experience has developed the fact that the cadets entering between the ages of fifteen and eighteen exhibit the greatest adaptability to the service, and acquire the most proficiency in the course of study and training at the Academy.

For reasons which have been frequently urged the course should be fixed at the former limit of four years. The additional two years at sea are clearly a hardship and of no positive advantage to these cadets not desirous or able to enter the service, while, of course, they are of no benefit to those who remain in the service.

Furthermore, a reduction of the course will permit appointments to the Academy to be made every four years instead of every six years, and the benefits of the course will be extended one-third—a benefit not merely to the cadet but to the Government which educates him.

The appointment of a cadet should be made at least one year before he enters the Academy. This course has worked well at the Military Academy. The new cadet will be better prepared to enter upon the duties and studies of the Academy, having this year to prepare himself for the work.

The Board is strongly of the opinion that all cadets should be actual residents of the districts from which they are appointed. The appointments recommended by members must, under the present law, be of actual residents of their districts. In case of a vacancy in any district, either by failure of the member to recommend, or from any other cause, the law should compel the Secretary of the Navy in filling the vacancy to appoint an actual resident of the district. The advantage of the Academy should be widely diffused and every district, if possible, should be represented.

SUBJECTS OF STUDY AND STANDARD OF SCHOLARSHIP.

The Board find that the ground embraced in its examination was gone over last year in the way of a series of questions and discussions

before the Board of Visitors by gentlemen unusually well equipped for such duty.

The desire was to know whether the entrance examination and subsequent course of study were too severe. This has seemed to be a perplexing question. There is much reason to doubt whether the proper correspondence has been established between the preliminary examination and the subsequent courses of instruction from the fact that so small a proportion of those admitted to the Academy succeed in attaining the standard prescribed for graduation.

In one recent year not as many as one-fourth of the number admitted after examination completed the course. The sense of the Academic Board as made known to the Board is that something should be added to the preliminary examination, with a view of diminishing this great disproportion between the number admitted and the meager number graduated.

It is suggested that some knowledge of geometry should be required of the candidate; also something more comprehensive in the matter of geography and history. The condition of common school education in the country is such at this time that almost any village has a school that will amply prepare a boy for this standard of examination.

If the law appointing cadets is so changed, as we conceive it should be, so as to require a year's notice of a coming vacancy, ample time would be given intending candidates to so prepare themselves for admission as to make success reasonably sure.

It is believed that the cases are exceptional where a boy of good mind, between the ages of fifteen to eighteen years, could not well meet the proposed requirements.

The Naval Academy should be so modeled as regards all its standards or requirements as to secure the highest results to the public service. Undue regard, therefore, should not be paid to political clamor, so far as its possibilities for increased usefulness are concerned. A high-grade service is its great desideratum and, in these days when knowledge is multiplied on every hand, an advanced standard of admission may reasonably be demanded, so that this national school shall be second to no other school in the older countries of the world.

GROUND, BUILDINGS AND SANITARY CONDITION,

The Academy grounds devoted to drilling purposes, as also for park and recreation privileges, are found to be in admirable condition, being equaled by few public-ground plots in the country.

The sanitary conditions seem and undoubtedly are excellent, as the general health of officers, professors, and students abundantly attest.

The building known as the students' quarters is inadequate in size and improperly and disadvantageously located, especially when the new or late acquisition of new grounds is taken into consideration.

It is not only insufficient in capacity and situated at too great a distance from the recitation-rooms, but will stand as an obstruction between the present campus and the additional grounds lately acquired, which grounds will be the outlet of the future to the grounds and cemetery beyond, or north of the river. Addition to the building would but render these quarters a still greater obstruction.

The unused hospital building should, the Board is convinced, be sold or otherwise disposed of as heretofore recommended by the Boards of Visitors for the years 1888 and 1889.

Referring to the recommendation urged last year for the erection of additional houses for officers detailed as instructors, we are impressed with the necessity of prompt action at least for four new double quarters, and that Congress should provide quarters for all officers stationed at the Naval Academy.

It is the judgment of the Board, in the absence of a survey made by experts, that the recitation hall should be replaced by a safe building, or the present hall thoroughly repaired, it being in a seemingly unsafe state.

SEAMANSHIP, ORDNANCE, AND NAVIGATION.

The Board has carefully and with much interest observed the target practice with great guns, and the drills in seamanship on Board of the *Wyoming*.

In those exercises the ship was under way in the bay; the cadets worked the ship under sail and steam, performing all the duties that would be required of a crew on board of a regular cruising vessel at sea.

The exercises of sails and light-yards were fairly well done, considering the opportunities they have had, and also taking into consideration the fact that the *Wyoming* is too heavy a ship in all respects to be used as a practice vessel.

In witnessing the exercises referred to the Board is convinced that a smaller and lighter vessel and proportionally rigged and armed with the latest type of guns and supplied in other respects with the improved fittings that are required and necessary to bring the ship up to the most perfect point of efficiency should be furnished the Academy with as little delay as possible.

The department of ordnance is efficiently conducted, as shown by the exercises and target practice on board the *Wyoming*; they were particularly good, and met with high commendation from the Board. The distance from the target to the ship was, on the average, about 1,000 yards; the target was totally destroyed, and but very few of the shots fired would have missed a moderate sized vessel. The guns' crews were cool and deliberate in working their battery, and showed a proficiency and excellence in their management that reflected great credit on their instructors and themselves, especially as some of the guns fired in this target practice were the old style 32-pounder, smooth-bores, mounted on the broad side Marseilles carriage.

The drill of the field pieces on shore was very good, and the cadets manipulated their pieces and maneuvered them with an ease and rapidity that was especially gratifying.

The exercise in fencing, the bayonet drill, the setting up and cane drills, showed the cadets to be proficient in the use of the rapier, saber, and bayonet, and this proficiency was a mark of their interest in the use of these weapons.

The examples placed before the Board in navigation leads it to conclude that the cadets understand thoroughly its principles and their application on all points necessary to become expert navigators.

In view of the fact that the torpedo service promises to become an important branch of naval warfare, the Board recommends that a torpedo-boat be stationed at the Academy for the practical instruction of the cadets.

DISCIPLINE, DRILL, PRACTICAL EXERCISES, ADMINISTRATION, AND POLICE.

The discipline of the Academy is worthy of the highest commendation, the rules established being only such as are necessary to the proper training of the cadets, and enforced with firmness and consideration; and the most kindly relations exist between the officers and cadets.

The orders issued January 20 and 25 last by the superintendent, establishing the department of discipline, are especially to be commended. By these orders the various offenses are properly graded as to punishments, those offenses affecting the character of the offender being, very properly, more severely dealt with than offenses merely indicating thoughtlessness.

Furthermore, while heretofore adequate punishment has been provided for offenses, no adequate recognition has been given to good conduct, efficiency, and attention to duty. By the orders issued as above, this has been corrected and cadets are properly credited for their meritorious behavior.

The Board has been especially gratified at the evidences of thorough training of the cadets in drill and tactical evolutions, as evidenced by the numerous and varied drills in the presence of the Board.

In this connection it approves of the act of the superintendent in offering medals for proficiency in great-gun target practice and small-arm target practice; the beneficial effect thereof is already apparent in the improvement of the cadets in this branch of their work.

The commissioned officers stationed at the Academy are to be commended for establishing by their contributions a permanent fund to procure a medal annually for general excellence in athletic exercises. The supervision of all drills, as well as the enforcement of the rules of discipline, devolves upon the commandant of cadets, and the Board recommends that he receive the highest pay of his rank, instead of shore pay, which he now receives.

It is recommended that the cadets be relieved from the payment of the wages of the servants employed about their quarters, such a charge not being imposed upon students in other institutions.

The Board finds that the police force of the Academy is ample in number, but by an apparent anomaly can not exercise ordinary police power for arresting offenders on Government grounds, and the Board recommends that proper legislation be enacted by Congress giving these officers, under proper restriction, the power of arrest and detention possessed by similar officers under State law.

STEAM, MATHEMATICS, PHYSICS, AND MECHANICS.

The work-shops and tools in the department of steam-engineering appears to be ample in quality and quantity for purposes of instruction in the methods of adjusting and constructing the metal portion of machinery in use upon and about the war vessels of our Navy; there seems to be, however, an absence of proper machinery in the wood-working department for the thorough instruction of the cadets.

The smith forges have been supplied with a long needed power blast during the past year, and are in good order. The antiquated slide-valve double cylinder engine used for instruction in steam-engineering should, in the opinion of the Board, be supplanted by a triple-

expansion condensing engine of modern and approved construction, such as are now in use in the Navy Department, but of a smaller size than the present slide-valve engine, and that the propeller wheel be submerged in a water tank—to cost about \$50,000—in such a manner that the practical workings may be observed and accurate measurements of speed, resistance, and power be obtained.

The course in mathematics is of a sufficiently high standard, and the cadets are well instructed in this important branch, so necessary in the study of naval engineering.

In the department of physics many improvements have been made, especially in the line of electrical appliances, and while the plant seems ample for instruction in the rudiments of electrical lighting and other branches of electrical science, the system might be extended, the Board thinks, with advantage to the lighting plant of the Academy, thereby preventing to a great extent the cause of failure of a number of the cadets by the overtaxing of the eye-sight by the use of other systems of artificial lighting.

ENGLISH STUDIES, MODERN LANGUAGES, DRAWING, PHYSIOLOGY, AND HYGIENE.

The fullest opportunity was allowed the Board to intelligently inquire into the methods of study in the above departments.

The instruction given in English studies and modern languages was marked by thoroughness and detail, all advanced methods being employed, while the teaching of drawing and physiology and hygiene was so complete and satisfactory as to leave nothing for the Board by way of suggestion or criticism.

Beyond a doubt the course of study will favorably compare with that of the best educational institutions of the country, thus supplying an admirable equipment to its graduates for honorable service in any capacity to which they may be called.

FINANCE AND LIBRARY.

After conferring with the officers and clerks of the various departments of finance represented by the storekeeper, commissary, and cadet's storekeeper, and a thorough examination of the methods of keeping the several accounts, the Board has arrived at the conclusion that the paymaster division of the Academy is well administered, and that the system of approval by various officers and of audits and checks by the members of the audit committee are good and sufficient to guard the finances of the institution.

An inspection of the library and interviews with the librarian show that the building is well adapted for the purpose for which it is used, the books well arranged and systematically cared for, and if it were not for the restrictions of the law requiring that the pamphlets, magazines, and rebound books shall be bound in ordinary cloth or "half-roan," the arrangement of the books upon the shelving would conform to the general appearance of a well conducted and maintained reference library.

It is, therefore, recommended that the suggestions of a former Board be carried out and that the library of the Naval Academy be excepted from the restrictions of the law and be added to the list of libraries that are not restricted in the character of binding.

The Board was most favorable impressed with the efficient and officer-like manner in which all that relates to the discipline and splendid condition of the institution has been conducted and pursued by the superintendent, Capt. Wm. T. Sampson, and his very effective aids, and embodies its sense of this matter in this report.

Very respectfully, your obedient servants,

L. A. KIMBERLY, *Rear-Admiral, U. S. Navy.*

J. C. S. BLACKBURN, *U. S. Senate.*

EUGENE HALE, *U. S. Senate.*

C. A. BOUTELLE, *M. C.*

WILLIAM C. WALLACE, *M. C.*

HARRY WELLES RUSK, *M. C.*

M. M. MURDOCK.

WM. A. NORTHCOTT.

W. H. ELLIOTT.

J. H. GALLINGER,

W. STUART WALCOTT.

A. W. CAMPBELL.

Hon. B. F. TRACY,

Secretary of the Navy.

REPORT OF THE CHIEF OF THE BUREAU OF ORDNANCE.

BUREAU OF ORDNANCE, NAVY DEPARTMENT,

Washington City, October 15, 1890.

SIR: I have the honor to submit the annual report of this Bureau, and also to transmit estimates for the fiscal year ending June 30, 1892:

(1) Fuel, tools, material, and labor; proof of naval armaments; expenses of target practice on the new vessels of the Navy; removal of the magazine at Craney Island to a more suitable locality, and new magazine at Sitka, Alaska.	\$255,000.00
(2) For a reserve supply of projectiles	60,000.00
(3) General repairs to ordnance buildings, machinery, magazines, and appendages	40,000.00
(4) Freight and miscellaneous expenses	10,000.00
(5) Civil establishment at navy-yards	30,041.25
(6) General expenses of the Torpedo Station	75,000.00
(7) Towards the armament of vessels authorized	4,158,850.00
Total.....	4,638,891.25

BREECH-LOADING GUNS.

The general system of manufacture and construction developed by my predecessor in the Bureau, Capt. Montgomery Sicard, U. S. Navy, has been adhered to, and it should be appreciated that it is due to his able, wise, and painstaking efforts, that the Department is at present in a position to proceed with confidence and energy with the rapid and efficient armament of the modern war vessels, the construction of which has been authorized by legislation.

The following table gives the number of sets of forgings thus far ordered, the number of guns completed to date, and the number in course of construction at the Washington gun factory, forgings for which have been delivered.

Caliber.	No. of sets of forgings ordered.	No. of guns com- pleted.	No. in course of construc- tion, forgings for which have been de- livered.
4-inch.....	85	4	12
5-inch.....	4	2	.....
6-inch.....	128	77	25
8-inch.....	35	15	2
10-inch.....	25	4	3
12-inch.....	8	.....	.....
13-inch.....	19	.....	.....

A 13-inch gun of 35 calibers has been designed, and tools for its manufacture are in course of construction at the naval gun factory.

The Bureau has not yet received any forgings of this size, but has entered into contract with the Bethlehem Iron Company for twelve sets for the batteries of the three battle-ships authorized by the act of Congress approved June 30, 1890.

It is thought that this will be the largest gun ever likely to be needed for naval purposes.

It will be found figured in the appendix.

Forgings for the 12-inch caliber will soon be received from the Bethlehem Iron Company, and all preparations have been made to proceed rapidly with their manufacture at the Washington navy-yard.

The forgings for the fourth gun of the *Miantonomoh* and three of the 10-inch guns of the *Maine* have been received and are in course of manufacture at the gun factory.

The Bureau has endeavored to adopt hand-power to the breech-closing system of the larger calibers, notably 10 and 12 inch, and has manufactured a type design adopted from a French invention, but has definitely adopted a system proposed by Ensign Dashiell, an attaché of the Bureau, which possesses much merit. A sketch of the design will be found in the appendix.

Six 8-inch guns of 35 calibers, of the design mentioned in the Bureau's report of last year, have been manufactured, and are enumerated in the list of guns completed. They have been thoroughly tested at Annapolis, and have furnished 2,100 foot-seconds initial velocity, with 15-ton pressure, the limit fixed by the Bureau, and with the standard projectile of 250 pounds.

Four of these guns have been issued to, and mounted upon, the *Baltimore*, and two will be mounted upon the *Charleston* in place of four of her 6-inch guns, on her return to the United States.

The Bureau has designed an 8-inch gun of 40 calibers, which type, in compliance with the suggestion of the Secretary of the Navy, it proposes to mount upon the 5,300-ton cruiser, known as cruiser No. 6. It will be found figured in the appendix.

It will be readily feasible to manuever this gun upon the improved carriage by hand-power, a desirable feature; and the flat trajectory due to the extremely high velocity which can be imparted to the projectile of this piece, will render it practicable to use it at the ordinary battle range without measurement of distance.

The contracts with the West Point Foundry, Cold Spring, N. Y., and the South Boston Iron Works, Boston, Mass., for the manufacture of 8-inch guns, have been completed, and the guns have been proved and issued to the service.

The Bureau has not made any further contracts with private firms

for work of this character, the capacity of the gun factory at the Washington navy-yard being more than sufficient to handle forgings as fast as received from the Bethlehem Iron Company, South Bethlehem, Pa., and the Midvale Steel Company, of Nicetown, Philadelphia, Pa., the domestic sources of supply of steel forgings.

The Bureau contemplates issuing 6-inch guns of 35 calibers in length to all of the fast cruisers authorized by the naval appropriation bill approved March 2, 1889, and June 30, 1890, and proposes to make no more contracts for forgings for 6-inch guns of 30 calibers in length.

A single example of this length of bore has been manufactured and tested at Annapolis. Its performance was satisfactory, a velocity of 2,100 foot-seconds, with a pressure of 15 tons having been obtained. It will be found figured in the appendix.

A 6-inch gun of 40 calibers length of bore, which will be found figured in the appendix, has also been designed, and forgings for two of this length have been ordered.

It is not considered that the rapid-firing feature, that is to say, fixed ammunition, cartridge-case, charge, and projectile in one, should be adopted for this caliber on account of the excessive weight when so constructed, and it is not believed that this caliber of the quick-firing variety has been entirely successful abroad.

The Bureau has commenced the manufacture of 4-inch and 5-inch rapid-fire guns, of 40 calibers length of bore, and a number of forgings for each have been ordered.

Two types of 4-inch guns, differing in the breech closure, have been manufactured, one having the ordinary interrupted screw breech plug and the other the Driggs-Schroeder block, so called from its inventor.

The 4-inch Driggs-Schroeder breech mechanism will be found figured in the appendix.

A specimen of the ordinary type has been fired forty-five rounds at the naval ordnance proving ground, Annapolis, Md., in the development of its powder and in the test of its carriage, and has furnished a velocity of about 2,000 foot-seconds with a pressure of about 14 tons, a charge of 14 pounds and a projectile of 36 pounds.

This result is extremely satisfactory, but is not final, as the conditions of the charge have not yet been fixed.

It is proposed that the combined weight of the cartridge-case, charge, and projectile for the 5-inch rapid-fire gun shall be not more than 100 pounds, which weight, it is anticipated, can be handled without difficulty. It is intended that the projectile shall weigh 50 pounds, the charge between 25 and 30 pounds. This relation, with the notable length of bore, should give excellent ballastic qualities, and the Bureau proposes that this shall be, after suitable tests, the *standard* quick-firing piece of large caliber. This should make a desirable piece to mount in time of emergency on board merchant vessels that may be acquired by the Department for war purposes, and an item has been inserted in the estimates for the next fiscal year for an amount sufficient to manufacture twenty-five of these pieces to hold in store. A drawing of this type will be found in the appendix.

A number of designs have been presented for the breech closures of the calibers under 8 inches, with the object of increasing rapidity of fire by opening and closing the breech by a single movement.

Of these the Bureau proposes to adopt for the 5-inch caliber after suitable test the design of Ensign R. B. Dashiell, and if found successful it will also be applied to the 6-inch caliber. It will be found figured in the appendix.

Another design presented by Lieut. Samuel Seabury, U. S. Navy, also offers features of advantage.

The adoption of rapid-fire guns of large calibers rendered it necessary to develop a plant for the manufacture of brass cartridge-cases for them, and, after some negotiations, an agreement was reached with the Winchester Repeating Arms Company, of New Haven, Conn., to supply 15,000 4-inch cases with an option to the Department to order 10,000 more at a reduced price.

The company has nearly completed the installation of machinery capable of making cases of the largest size ever likely to be required, and the delivery of the 4-inch cases will soon commence. These cases will be found figured in the appendix.

It is proposed to substitute for the short 3-inch rifle, heretofore issued to the service as a boat gun or for purposes of disembarkation with a naval force, a 6-pounder rapid-firing piece of relatively low ballistic power, and to use the same projectile as is adopted for the Hotchkiss and Driggs-Schroeder 6-pounder high-powered rapid-firing gun, reducing the charge by an amount which will limit the violence of recoil of the piece to the capacity of an ordinary field carriage. The ammunition will be fixed.

It is believed that this piece will have a certain merit as field artillery, its projectile having perhaps equal mining power with that of the 3-inch gun which it replaces, and greatly increased range and accuracy. A greater number of rounds can also be carried in the same weight and bulk when disembarked.

Five forgings for this caliber have been ordered and are in process of manufacture at the Washington navy-yard.

A satisfactory field-carriage has been designed for this piece in the Bureau.

This gun and its carriage will be found figured in the appendix.

The 1-pounder rapid-firing piece heretofore issued to the service has been considered to leave much to be desired in design, having insufficient ballistic power and furnishing an extremely violent recoil. The Bureau has therefore had designed a piece 40 calibers in length and weighing about 100 pounds, which it proposes to substitute for the short 1-pounder as fast as may be, and has ordered fifteen of these pieces with the Driggs-Schroeder system of breech closure. It is believed that this piece, which will be found figured in the appendix, should take the place of the 37^{mm} revolver cannon, the latter being unwieldy and difficult to maneuver in rapid pointing.

It is assumed that three of these pieces will have equal rapidity of fire with the five barrels of the cluster, and their distribution at different points will be a more effective arrangement in action.

For the present the ammunition of the new piece will be that of the 37^{mm} revolver cannon and the old model single-barreled 1-pounder gun.

The Bureau desires to have recognized the valuable services of Ensign Philip B. Alger in the development of naval-ordnance construction.

MORTAR.

In connection with the use of high explosives, which the Bureau has always considered should be used from a powder gun in naval operations, the Bureau has designed a piece which may be called a rifled mortar, although its length is somewhat greater than that usually given to the mortar. It is proposed in this piece to project a charge of

100 pounds of high explosive. A sketch of the gun will be found in the appendix.

It is intended that this piece shall be mounted on board of special vessels, as the ram, which are intended to fight at close quarters.

SUBMARINE GUN.

The act of Congress approved June 30, 1890, appropriated \$30,000 for the purpose of enabling the Secretary of the Navy to manufacture and experimentally test, under rules and conditions to be prescribed by him, a submarine gun and projectiles for the same, with the proviso that no part of this money should be expended until the owners of the patents to be tested should agree by contract to give the Government the option, within a specified time, to contract, at such price as shall be satisfactory to the Secretary of the Navy, for the exclusive right on the part of the Government to manufacture, by contract or otherwise, such submarine guns and projectiles without payment of any royalty on the same.

In accordance with the above-mentioned act of Congress, the Navy Department has, under date of the 19th of September, 1890, entered into contract with the Ericsson Coast Defense Company for one submarine gun and six steel projectiles for the same, said gun and projectiles to be placed, fixed, and secured in position on board the steam-vessel known as the *Destroyer*.

It is proposed to make a thorough test of this system of submarine artillery, which possesses undeniable advantages, if applied to special types of vessels, such as the ram designed for work at close quarters.

The experiments will be conducted at the Torpedo Station, Newport, R. I.

HURST REINFORCE CARTRIDGE AND ARMS.

A preliminary agreement has been reached with the Hurst Reinforce Cartridge and Arms Company, under which the company may present to the Department for test one 1-pounder, one 3-pounder, and one 32-pounder Hurst rapid-fire guns with one hundred cartridges for each, the actual cost of manufacture of said guns and ammunition to be paid for by the Department out of the appropriation of \$50,000 made by the act of August 3, 1886. Should these guns give certain stipulated results, the Department has the option of purchasing for the Government the exclusive right to their manufacture for a stated price.

STEEL CAST GUNS.

The 6-inch open-hearth steel cast gun, manufactured by the Standard Steel Casting Company, of Thurlow, Pa., and of which the first trial was detailed in last year's report, was, at the request of the company, submitted to a further test in April, 1890. This second test consisted of a repetition of the original test of ten rounds with service charge and projectile. The result was that the permanent extension of the bore due to the first trial was about doubled near the seat of the projectile, and an enlargement was produced all the way to the muzzle. The flaws reported after the first trial were also observed to be somewhat extended.

The gun was therefore finally rejected.

POWDER.

The manufacture of brown powder for the naval service has continued by Messrs. E. I. Dupont & Co., of Wilmington, Del.

The powder for the 6-inch B. L. R. has been produced by them with uniform success, in advance of the demand for it for the new ships. In the 30-caliber gun the requirements have been maintained at a muzzle velocity of 2,000 foot-seconds to the 100-pound shell with a pressure of 15 tons. In the 35-caliber gun a muzzle velocity of 2,100 foot-seconds is obtained with practically the same pressure.

Numerous samples of brown powder for the 8-inch B. L. R. have been tested, and a lot of 20,000 pounds was accepted as a partial allowance for the *Baltimore*, and for ranging the gun. Later samples of powder for this gun have given much better results, and there does not appear to be any difficulty in obtaining with the 35-caliber gun a muzzle velocity of 2,100 foot-seconds with a pressure of about 15 tons. Satisfactory results have also been obtained with brown powder in the 10-inch B. L. R. A lot of 10,000 pounds has been accepted, which gives a muzzle velocity of 2,000 foot-seconds in the 30-caliber gun, with a pressure of about 15 tons. Other samples have done better. These results may be considered as extremely gratifying, being, with the same weight of projectile and a charge of from 5 to 10 pounds less according to the caliber, from 2½ to 3 tons less in pressure and about 50 foot seconds greater in muzzle velocity than obtained in service abroad with brown powder.

Samples of brown sphero-hexagonal and cubical powder have been tried in the 4-inch B. L. R., but better results have been obtained with the 6-inch grain in this gun. Further experiments will be made with an increased capacity of chamber or cartridge case, when it is expected from the results already obtained that there will be no difficulty in obtaining a muzzle velocity of 2,000 foot-seconds with the 36-pound shell, and a charge of about one-third with a pressure of less than 15 tons. A lighter shell may be used.

Arrangements have been made with Messrs. Dupont & Co. for the manufacture of brown powder of a new and smaller form of prismatic grain for the 5-inch and 4-inch R. F. guns, better adapted for the cartridge-cases of these calibers.

The manufacture of cubical black powder for filling the 3 and 6 pounder cartridge-cases of the Driggs-Schroeder and Hotchkiss guns is continued by Messrs. Dupont & Co. The powder for these guns is no longer identical, better results being obtained with a separate powder for each caliber.

During the year Messrs. Dupont & Co. have, at the suggestion of the Bureau, acquired the rights in the United States of the Chilworth Company of England, those of the United German Factories and of the Wetteren Company in Belgium, and are thus in a position to manufacture brown powders of the same qualities as are furnished European Governments, should it prove desirable.

Considerable prominence has been given abroad to the use of the so-called smokeless powders in rapid firing guns, and, in a more limited extent, their use in the larger calibers. None of these powders have been as yet definitely adopted by foreign governments, and it is probable that some time will have elapsed before they are issued for service on board ship.

For small arms a number of successful experiments have been reported by our attachés and in the public press, but the Bureau has not

heard of the definite adoption and use of smokeless powder for small-arms except in France, where the secret of its manufacture has been well guarded.

The Bureau considers that it will be the part of wisdom to await more definite action in this direction in Europe before committing itself to any of the powders thus far suggested. The question of stability in store is so important that, since the Department possesses excellent powder of the older varieties, it can afford to await until time and experiment will throw more light upon the subject. In the meantime the results obtained abroad and all experiments are closely observed and noted, and samples are tested and analyzed as fast as received. The Bureau proposes to be able at a given moment, when desired, to domesticate in this country the manufacture of smokeless powder.

HIGH EXPLOSIVES.

During the year the Bureau has had numerous experiments carried on simultaneously at the torpedo station and at the naval ordnance proving ground with Emmensite, a high explosive invented by Prof. S. H. Emmens.

The reports from both stations have shown that this material has an explosive force about equal to that of gun-cotton. It is insensitive to friction and impact of projectiles, and only locally ignited by flame, the combustion ceasing when the flame is removed. It is practically unaffected by large changes of temperature, is uninjured by freezing and thawing, and loses but little strength even after repeated saturations with water and drying. It is capable of explosion by a gunpowder fuse, when strongly confined, giving an explosion which approaches detonation.

A high explosive which can be detonated without the use of fulminate would be peculiarly valuable for ordnance purposes, and the Bureau will therefore continue the experimental investigation and trial of Emmensite.

COMMON SHELL.

Common shell and shrapnel of cast iron up to 10-inch in caliber have been manufactured at the Washington navy yard and supplied to the new ships as fast as needed.

Common shell of cast-steel, while possessing the advantage of containing much larger bursting charges, have not proved altogether satisfactory on trial, and for the present their manufacture has been discontinued.

The Bureau has long since desired to develop in this country a process of forging common shell of steel which has been in use for some time abroad, and which possesses marked advantage in the feature of the amount of the mining charge carried over that presented in cast-iron projectiles.

It has recently entered into negotiation with an American firm which has acquired the right to manufacture under one of these processes, which is patented, and expects shortly to have specimens up to 6-inch in caliber for test, and that this valuable manufacture will thus be definitely established in the United States. It will be found to be especially desirable for the rapid fire guns of 4 and 5 inch in caliber.

ARMOR-PIERCING PROJECTILES.

Experiments have continued in the development of metal and temper methods for armor-piercing projectiles. A number of private firms in this country have furnished specimens of the 6-inch caliber, tempered in some cases by their own processes and in others by methods suggested by the Bureau or the Washington Gun Factory. None of these, however, have been sufficiently successful thus far to warrant serious action on the part of the Bureau. It became necessary therefore to acquire one of the well-known French methods, namely, the Holtzer or Firminy, which have been generally adopted in Europe.

Overtures were made to the owners of these processes, which are secret, with the result (the price of the Holtzer being found excessive) of the acquisition through an American firm, the Carpenter Steel Company, of Reading, Pa., of the Firminy process improved, as it is claimed, by Messrs. Firth & Sons, of Sheffield, England, and a contract was made with the Carpenter Steel Company, involving the amount of \$200,000 for projectiles of calibers from 6 to 12 inch inclusive.

Specimens of this manufacture will be presented for test within a short time, and it may be anticipated that the Bureau has thus arrived at a solution of this difficult question.

It being desirable, however, to acquire the Holtzer process as well, the Bureau has instituted measures leading to such acquisition, and it is anticipated that within a few months both methods will be at the disposal of the Department.

The Bureau's designs of armor-piercing projectiles will be found figured in the appendix.

MOUNTS FOR MAIN BATTERIES.

The mount for the 4-inch rapid-fire gun mentioned in the last report has been completed and tested with satisfactory results, and a similar mount for the 5-inch rapid-fire gun has been designed. These mounts are of the same type which has been successfully used for the secondary battery guns, and being on anti-frictional bearings they enable a single operator to point and fire from the shoulder 4 and 5 inch guns with the same facility as 3 and 6 pounders.

The 5-inch mount and a similar design for a 6-inch gun-carriage are shown in the appendix. All the carriages are so arranged that electric motors can be applied to them if it be found desirable.

The manufacture of 6-inch central pivot carriages has continued on the lines as developed by my predecessor and they have given entire satisfaction. The adoption of a single steel casting for the slide and improvements in methods of manufacture have reduced the average cost of these carriages from \$6,556 to \$2,824.

The 8-inch central pivot carriages of the *Baltimore* and *Charleston* have been completed and tested, and they give complete satisfaction.

The 8-inch guns of the *Chicago* and *Baltimore* have been found to work easily and well by hand, but the Bureau considers it desirable to develop the application of electricity to the handling of guns, and has contracted with the Edison Electric Company and the Thomson-Houston Company for motors to be applied to an 8-inch gun carriage so as to control all the motions of the gun.

The 8-inch guns of cruiser No. 6 (5,300 tons), armored cruiser No. 2 (8,100 tons), and the battle-ships are to be mounted in turrets and it is

proposed to use electric power for handling them. The 8 inch turret mount for cruiser No. 6 is shown in the appendix; that for cruiser No. 2 and the battle-ships will be of the same type as is adopted for the 10-inch guns of the monitors.

The detail designs of the 10-inch mounts for the *Amphitrite*, *Monadnock*, *Maine*, and *Monterey* have been completed and their construction has been begun.

The 12-inch mounts for the *Puritan*, *Texas*, and *Monterey* are of similar design and their construction has also been commenced.

The drawings of the 13-inch gun mounts for the new battle-ships are being prepared. They are of the same type as the 10 and 12 inch mounts which are shown in the appendix.

The Bureau desires to commend the able work of Lieut. A. McCrackin in the development and elaboration of the designs of the mounts of the heavy guns of main batteries.

SECONDARY BATTERIES.

The Hotchkiss Ordnance Company has filled its original contract with the Department for ninety-four Hotchkiss guns and for ammunition for them, with the exception of steel shell for 6 and 3 pounder, in the manufacture of which, of the proper quality, considerable difficulty has been experienced.

In addition the company has delivered under subsequent orders the following articles: 3-pounders, 5; 1-pounders, 2; 37^{mm} revolving cannon, 12.

The Driggs Ordnance Company has begun work on the ten 6-pounder and ten 3-pounder guns ordered last year, and also on the ammunition for them. The guns are being constructed by Colt's Patent Fire-Arms Manufacturing Company, of Hartford, Conn., and the ammunition by the Union Metallic Cartridge Company, of Bridgeport, Conn.

An order has recently been given to the same company for fifteen high-power 1 pounder trunkless guns.

At a competitive trial of 1-pounder ammunition, held at the Naval Ordnance Proving Ground, Annapolis, Md., in June last, in which the Hotchkiss and Driggs Ordnance Companies were competitors, the first named company was successful, and received an order for 20,000 rounds.

A 6-pounder field gun has been designed and forgings ordered for its manufacture. Its breech mechanism will be of the Driggs-Schroeder type.

The recoil mounts for 3 and 6 pounder guns with automatic return designed by Lieut. F. F. Fletcher, U. S. Navy, have been improved by him and have been supplied to all new vessels fitted out within the year. A similar mount for the new high-power 1-pounder guns has been designed by him and is in process of manufacture. The Bureau desires to mention particularly the excellent services of this officer. All these mounts will be found figured in the appendix. A cast-steel stand for the 1-pounder has been designed and found much lighter than the old cone mount; it is figured in the appendix.

As before stated, the Bureau proposes to limit the small rapid-firing pieces to the 6-pounder and the 1-pounder calibers, and to abandon as fast as advantageous the 3-pounder quick-firing pieces, the 47^{mm} and the 37^{mm} revolvers.

The negotiations with the Maxim-Nordenfeldt Guns and Ammunition Company for the purchase of a number of 45-caliber and 1-pounder automatic guns, which were in progress at the date of the last report,

were not concluded, owing to unsatisfactory reports from abroad concerning the financial condition of the company and the performance of the guns. The Bureau, has, however, ordered one automatic musket-caliber gun from that company for the purpose of carrying on proposed extensive experiments with smokeless powders.

The Bureau has recommended the following changes to be made in the secondary batteries of the vessels now in course of construction:

Vessel.	Present secondary battery.					Proposed secondary battery.			
	6-pounder.	3-pounder.	1-pounder.	37mm.	Gatling.	6-pounder.	3-pounder.	Gatling.	37mm.
Gunboat No. 5 (1,000 tons)		2	1	2	12	4	2	2	
Gunboat No. 6 (1,000 tons)		2	1	2	12	4	2	2	
Cruiser No. 6 (3,300 tons)	6	6	2	4	4	14	6	4	
Cruiser No. 7 (3,000 tons)	12	2	1	2	2	8	4	2	
Cruiser No. 8 (3,000 tons)	12	2	1	2	2	8	4	2	
Cruiser No. 9 (2,000 tons)	12	2	1	2	2	6	2	2	
Cruiser No. 10 (2,000 tons)	12	2	1	2	2	6	2	2	
Cruiser No. 11 (2,000 tons)	12	2	1	2	2	6	2	2	
Maine	4	8	2	4	4	12	6	4	
Armored cruiser No. 2	4	4	4	4	4	12	12	4	
Texas	4	8	4	4	4	12	4	2	4
Monterey	4	2	2	4	12	6	4	2	

MACHINE GUNS AND SMALL-ARMS.

Nothing has been done with regard to procuring machine guns or small-arms, as the Bureau is awaiting the settlement of the question of caliber by the ordnance department of the Army, it being extremely desirable that both branches of the service should use the same cartridge.

It can not be claimed that the results thus far obtained with the small caliber rifle and with smokeless powder have been found to be entirely satisfactory in any European country. The most persistently favorable results are reported from France, where the powder secrets have been well guarded, but there are reports of failures from France as well.

It seems fairly probable that the abrupt change in European armies to the small caliber, now almost universally adopted, was made without complete justification. The ballistic results, using brown powder and a perforated cartridge with the small caliber, were not satisfactory, the question of fouling entering to a disastrous extent. It then became necessary to adopt one of the nitro-explosives in order to use the small caliber bullet. This was demanded as much for its non-fouling qualities as for the smokeless feature.

The Bureau is reliably informed that several European countries are now to a certain extent provided with small caliber rifles in which they can not use the brown or black varieties of powder on account of the fouling, and for which they have not yet been able to obtain a satisfactory smokeless non-fouling variety.

It is believed that in most cases the reduction of caliber has been too great, and that this should not go below .32.

It will therefore seem to be the part of wisdom to delay for a time, watching carefully the results obtained abroad, the definite adoption of any small caliber. In the meantime all the private factories in this

country, as well as the Bureau, are closely observing European results and experimenting with domestic and foreign samples where these furnish definite evidence of advantage.

A .45 caliber Gatling, model 1884, has been fitted experimentally with a small electric motor, as a substitute for hand power in turning its firing crank. The preliminary tests of this device have shown that the rate of firing of the Gatling can be thereby increased to upwards of one thousand rounds per minute, while the advantages in increased smoothness and regularity of fire are very marked.

A tripod stand for the Gatling gun has been designed and will be found figured in the appendix.

The Colt's Arms Company, of Hartford, Conn., has completed the delivery of the five thousand revolvers ordered.

PRIMERS AND FUSES.

The difficulty of manufacturing a successful electric primer of the small size adopted for the service has induced the Bureau to consider the advisability of increasing the interior diameter of the standard primer, retaining, however, its general form. A new and simple firing attachment has been devised for use with the new primer, and if after thorough trial both prove satisfactory they will be adopted and gradually replace those in present use. This change will involve only an alteration in the mushrooms of guns already issued to service.

The new attachment and primers will be found figured in the appendix.

Experiments with a base fuse have continued, and a form which promises well will shortly be submitted to final tests.

Fuses of several forms have been devised for use with shells loaded with high explosives, and the experiments thus far made indicate the speedy development of a means of detonating high explosives on impact, while assuring safety from explosion due to shocks of firing from powder guns.

THE HOWELL TORPEDO.

The Hotchkiss Ordnance Company has not yet presented a torpedo for official trial, as required by the terms of the specifications of the contract dated January 5, 1889, owing to the loss of two torpedoes at preliminary trials by the company and to difficulties met with in developing the weapon. An extension of the contract time for delivery has been granted by the Department, and the contractors expect to be ready for the official trial and to deliver the torpedoes contracted for by the 1st of January next.

The 10 launching apparatuses ordered are practically completed and await the completion of a torpedo for official trial.

THE WHITEHEAD TORPEDO.

The Department having been placed in a disadvantageous position with regard to the supply of torpedoes for the vessels completed and in course of construction on account of the failure of the Hotchkiss Ordnance Company to present a successful specimen of the Howell torpedo, the Bureau instituted correspondence with the Whitehead Torpedo Company, of Fiume, Austria, with the view of adoption in this country of the torpedo of their manufacture. Favorable terms have been obtained, and an order will shortly be placed with a reputable American firm for a number of them.

It is the Bureau's intention to make competitive tests and trials of this torpedo with the Howell, and definitely adopt for service uses one or both of these.

THE PATRICK TORPEDO.

One of the three torpedoes ordered February 26, 1889, from Mr. J. N. H. Patrick, and referred to in the last report, has been submitted to test and found to fulfill the requirements of the contract. The other two have been manufactured and will be accepted on passing the required tests. The report of the trial board will be found in the appendix.

It is proposed to use these torpedoes, as originally intended by the Department, for instructional purposes, in connection with the War College at Newport, R. I.

In this connection the bureau desires to recommend the advantages which would accrue to the Department from its acquisition of the whole of the torpedo-defense system, a portion of which is at present controlled by the Engineering Department of the Army.

THE HALL TORPEDO.

The act of Congress approved June 30, 1890, appropriated \$20,000 for the purpose of testing torpedoes, and the Bureau proposes to develop under this appropriation the design of Lieut. M. E. Hall, U. S. Navy, which possesses merit.

It is of the automobile system and differs but slightly from the Whitehead type. One of these will be manufactured from the designs furnished by the inventor at the torpedo station, Newport, R. I.

TORPEDO DEFENSE NETS.

Steps have been taken to arrange for the manufacture in this country of a steel wire netting, which, while strong enough to stop automobile torpedoes, shall be light and flexible. Samples are now being made for several different designs, which will soon be ready for trial, and it is thought that at least one will be found to fulfill the desired conditions.

It is the intention of the Bureau to recommend that only armored vessels shall be supplied with these nets.

TORPEDO BOAT.

The steel sea-going torpedo boat provided for by act of Congress approved August 3, 1886, has been completed by the Herreshoff Manufacturing Company, of Bristol, R. I., and, having been submitted to trial on March 31, 1890, before a board of which Commander T. F. Jewell, U. S. Navy, was senior member and proved complete and satisfactory according to the contract requirements and conditions, has been accepted. This boat, which has been named the *Cushing*, has developed a speed of about 26 knots and is considered in all respects satisfactory. Her armament will consist of three 1-pounder guns and three torpedo tubes.

The report of the board ordered to conduct the trials of this vessel is appended.

The Bureau has considered that it will be advantageous to the Department to transfer the construction of all torpedo boats to the Bureau of Construction and Repair, which recommendation has received the approval of the Department.

ARMAMENT OF THE NEW VESSELS.

Since last report the armaments of the *Baltimore*, *Philadelphia*, and *San Francisco* have been completed and installed, and the batteries of the *Newark* and *Concord* completed and are ready for installation.

It is considered that the value of the *Concord* class would be increased by the substitution of a larger number of rapid-fire guns for the six 6-inch guns now constituting the main batteries. Accordingly the Department has decided to arm the *Bennington* with eight 5-inch R. F. guns, and their construction and installation will be pushed as rapidly as possible.

The 8-inch guns and carriages of the *Charleston* have also been completed and will replace four of her 6-inch guns on her return to the United States.

The forgings for the fourth 10-inch gun of the *Miantonomah* have finally been received and the battery of that ship will soon be completely installed.

The Department having decided to replace the 16-inch gun of the *Monterey* by two 12-inch guns, and the 12-inch in the after turret by two 10-inch guns, the necessary changes in the plans for that vessel have been made.

The Department contemplates mounting 8-inch guns of 40 calibers in length on Cruiser No. 12.

An appropriation having been made for fitting out the *Lancaster* as a gunnery ship, the Bureau has begun the manufacture of her new armament. Her main battery will consist of one 8-inch, two 6-inch, and two 4-inch B. L. R., and will soon be completed and installed.

The Department having decided to use the *Alarm* as a gunnery training-ship for apprentices, the Bureau has temporarily installed upon her a 6-inch B. L. R. and a secondary battery of two 3 pounders and one 37^{mm} R. O.

The service trials of the dynamite guns of the *Vesuvius*, and the tactical tests with that vessel, have not yet taken place owing to failure of the company to fill an order for projectiles.

The increased rapidity of delivery of forgings from the Bethlehem Iron Company and Midvale Steel Company, and the development of the Washington Gun Factory, are such as to warrant the belief that batteries can hereafter be furnished ships as fast as they are completed.

It is gratifying, as each of the modern vessels is provided with her armament and makes her prescribed sea tests, that favorable reports of the performance of the ordnance material are received. The Bureau, however, proposes to make extensive experiments with the view of improving certain minor details.

THE BETHLEHEM CONTRACT.

The contract with the Bethlehem Iron Company for steel gun-forgings, dated May 1, 1887, provided for the material for the following guns:

6-inch	46
8-inch	4
10-inch	24
12-inch	2

Under the provisions of this contract the Department has changed the numbers of the different calibers as follows:

6-inch.....	41
8-inch.....	6
10-inch.....	22
12-inch.....	4

These changes were made in connection with further orders for sixteen sets of 6 inch forgings from the Midvale Company, for the purpose of keeping the gun factory supplied with forgings and of providing in time the main batteries of new vessels as finally fixed.

During the year further orders have been placed with the Bethlehem Iron Company for seven sets of 8-inch, three sets of 6-inch, two sets of 5-inch, and ten sets of 4-inch forgings.

The company has thus far delivered under the contract and the above orders seven sets of forgings for 8-inch guns, twenty-five for 6-inch guns, six for 4-inch guns, and three for 10-inch guns. These deliveries are in advance of the contract times.

Some of the forgings for 12-inch guns are in course of manufacture, and deliveries of these sets will soon commence.

In order to provide in time the material for the guns of the main batteries of all the ships now authorized, including the three battleships and cruiser of 7,500 tons, the Department has made an additional contract with the Bethlehem Iron Company for the following sets of forgings for guns of different calibers:

6-inch guns of increased length and power.....	3
8-inch.....	14
12-inch.....	4
13-inch.....	12

The delivery of the 12-inch and 13-inch forgings is to begin in fourteen months. It is expected that the large gun-lathes will be erected in time for these forgings, and that these guns will be completed without delay.

The plant which is being installed by the Bethlehem Iron Company for the manufacture of armor under the contract with the Navy Department, dated June 1, 1887, has taken longer in its completion than was contemplated. It is not yet completed, nor have any deliveries of armor under the contract been made.

The estimated dates of completion of the different parts of the new plant of this company are as follows: 125-ton hammer, June 1, 1891; treatment plant for armor, January 1, 1891; treatment plant for gun-forgings above 12 inch caliber, July 1, 1891; bending press for armor, July 1, 1891; plate-mill, October 1, 1891.

I desire to mention specially the able and thorough work of Lieut. C. A. Stone in connection with the preparation of the specifications of the important contracts for forgings and armor which have been made during the year by the Department.

ADDITIONAL ORDERS FOR ARMOR PLATES.

In order to prevent delay in the completion of the coast-defense vessel *Monterey*, for the want of portions of her armor, without which her hull could not be finished, an order was placed with the Bethlehem Iron Company, of South Bethlehem, Pa., for the barbette armor of this vessel, about 160 tons, to be delivered in six months.

The greater part of the protective decks of the *Maine* and *Texas*, which armor was included in the Bethlehem contract, having been otherwise

supplied, the Department has obtained the consent of the Bethlehem Iron Company to substitute therefor an equal weight of nearly similar armor for other vessels. The sponson armor for Cruisers Nos. 7, 8, 9, 10, and 11 will be thus supplied, leaving a balance of over 800 tons of their armor under that contract still available.

THE MIDVALE STEEL COMPANY.

The Midvale Steel Company, of Nicetown, Philadelphia, Pa., is now engaged in the installation of a plant for the manufacture of forgings for guns of larger calibers than it has hitherto undertaken to furnish.

By the early part of next year it is thought that this company will be able to cast, forge, and machine 10-inch gun-work, and to cast and forge to 13-inch gun-work.

There will thus be two firms in the United States ready to supply any gun forgings that are likely to be needed.

The delivery of the six sets of 6-inch forgings mentioned in the last report having been completed, further orders for sixteen sets of 6-inch were placed with the Midvale Company, and of these ten sets have been delivered.

Besides this, the forgings for five 6-pounder field-guns and twenty-five 4-inch guns have been ordered from the Midvale Company, and are being rapidly supplied.

This company has thus far furnished the Department with seventy-five sets of 6-inch and eight sets of 4-inch forgings.

THE NEW GUN FACTORY.

The buildings for the gun factory proper have been completed since last report, all the machinery has been installed in the south gun-shop and is in full operation. The 110-ton overhead traveling crane has been erected on its supports in the north gun-shop, tested and found to be satisfactory. A few changes in the hoisting-purchase are being made by the contractor, upon the completion of which the crane will be accepted. The large gun-lathes for this shop have been contracted for by the Department with Messrs. Wm. Sellers & Co., of Philadelphia, Pa., under date of July 10, 1890, after advertisement dated December 27, 1889, February 13 and March 7, 1890.

The Department's design and the Seller's design for these lathes will be found figured in the appendix.

This contract requires the completion and erection of two of the lathes by January 10, 1892, and all of the lathes within thirty-three months from the date of the contract, or by April 10, 1893, and the contract date for the delivery of the forgings for 12 and 13 inch guns is made to correspond with the deliveries of these large machine tools, that there may be no delay in the completion of the main batteries of the battle-ships.

The Bureau considers that the large gun-lathes of this contract will be superior in design, capacity, handiness, and accuracy of work and in finish to any similar machine tools now in use abroad, and the Department is to be congratulated upon this development in our resources. Tools of this class and size are at present only manufactured by two or three firms, and these in England and France.

The shrinkage-pit and gun-carriage shop have been completed since last report, and are in full operation; the office building also has been completed and is at present occupied.

The railway siding, which has been constructed from the Baltimore and Potomac Railroad into and around the navy-yard, has greatly facilitated the delivery of gun-forgings and the shipment of ordnance material.

The Bureau has acquired by purchase a shifting-engine.

The Bureau has acquired during the year several *special* machine tools, notably boring-mills and boring and turning lathes, of the firm of Bement, Miles & Co., of Philadelphia, Pa., and desires to mention specially their efficiency and the merits of the manufacture.

With the increase in the quality and the amount of the machinery at the naval gun factory and in the adoption of fixed and advantageous methods of shop administration and of settled principles, a large economy has resulted in the production of all material. This is especially apparent in the manufacture of tools, of projectiles, of guns and carriages.

The following tables illustrate the material advantages above referred to:

Guns.

Caliber	Average cost of manufacture.			Average time of manufacture in 10 hour days.	
	Washington Gun Factory.		By contract with private firms.	Washington Gun Factory.	
	1888.	1890.		1888.	1890.
6-inch	\$2,640	\$1,298	\$3,400	115	60
8-inch	5,163	2,772	8,500	225	120
10-inch	6,334	3,500	.....	240	164

6-inch carriages.

	Labor.	Material.	Total cost.
Average of—			
First 10	\$4,427.10	\$2,133.21	\$6,556.31
Second 10	3,027.41	1,283.32	4,310.73
Third 10	2,250.74	1,101.35	3,352.09
Fourth 10	1,968.05	1,344.67	3,312.72
Fifth 10	1,708.00	1,116.00	2,824.00

The Bureau has secured the services of a capable chemist, and has installed a laboratory complete in all respects for analytical work and for experiments in explosives in connection with the new proving ground at Indian Head.

A marked advantage in the direction of economy has already resulted from this new department in the item of lubricating oils, the shop now manufacturing its own oil.

The Bureau anticipates advantageous developments in various directions from this addition to the facilities of the gun factory.

The shops have been completely provided with an electric-lighting plant, and it is at present practicable to work at night in case such course should be demanded.

A contract has been made with the Morgan Engineering Company of Alliance, Ohio, for a 15-ton crane, which will be placed upon the

tracks of the 40-ton crane now in use in the south gun-shop, the latter having been found insufficient to perform the work required of it.

The Bureau proposes to extend these tracks, which now reach but to the shrinking-pit, throughout the whole length of the north gun shop, in order to avoid the disadvantage of shifting weights from one crane to another.

The gun factory is at present under the charge of Commander Charles O'Neil, to whom the Bureau is indebted for many valuable improvements and suggestions in the development of the machine plant and of the naval material.

NAVAL ORDNANCE PROVING GROUND.

This establishment has been since last report in the charge of Lieut. Commander J. H. Dayton, U. S. Navy.

Proof of guns and mounts, both for main and secondary batteries, the development and test of powders, ballistic tests of steel for ordnance purposes, the trial of projectiles of all kinds, the ranging of guns, and numerous other trials and tests have been made.

Besides these, the second test of the Thurlow cast-steel gun and the competitive armor trials have occurred at the proving ground.

To the successful conduct of this necessary work all the officers stationed at the proving ground have contributed by their zeal and attention.

NEW PROVING GROUND.

Under authority of the acts of March 3, 1887, and June 30, 1889, the Bureau purchased, in February, 1890, a tract of land 659 acres in extent in Charles County, Md., on the Potomac River and about 26 miles below Washington. At this spot a wharf has been built, magazine and instrument houses are being erected, buits put up, gun platforms for all calibers of guns constructed, and all preparations made for prosecuting the necessary work of proving and ranging guns and testing powder, carriages, projectiles, and other ordnance material. This important work has been in charge of Ensign R. B. Dashiell, and the Bureau begs to commend his zeal and ability in its prosecution. It is proposed to transfer to this point all the work thus far done at the Annapolis Proving Ground, and it is believed that the difficulties and risks which have attended such work at Annapolis will no longer exist. The greatest advantage to be realized by the transfer, however, will be the saving in time and cost of transportation from the gun factory to and from the proving ground.

It is anticipated that the advantages of the direct contact of the manufacturing establishment with the proof of the material will be at once apparent, and result in increased efficiency in all departments of the manufacture.

ARMOR TRIALS.

During the year reports were received from abroad of remarkable results obtained in private trials of a new material for armor, an alloy of steel with nickel. The Department, recognizing the importance of adopting while there was yet time the best possible armor for the Navy, thereupon resolved to hold a competitive trial of armor plates at the Naval Ordnance Proving Ground at Annapolis. Accordingly three plates, the first a compound plate made by Cammell & Co., the second a steel plate made by Schneider & Co., and the third a nickel-

steel plate by the same firm, all 8 feet by 6 feet by 10½ inches, and backed by 3½ inches of oak strongly braced, were submitted to a competitive test before a naval board, of which Rear-Admiral Kimberly was president.

Each of these plates was attacked with four 6-inch Holtzer shells of 100 pounds weight, and having a velocity of 2,075 foot-seconds, and one 8-inch Firming shell of 210 pounds weight, and having a velocity of 1,850 foot-seconds, the points of impact being at the four corners for the 6-inch and at the center for the 8-inch shell.

The compound plate was perforated by all the shell and practically destroyed by the 6-inch alone.

The steel plate kept out all the shell, but was badly cracked by the 8-inch.

The nickel plate kept out all the shell and remained without cracks.

The results of this, the first public trial of nickel-steel armor, have shown the wisdom of the Department in adopting steel rather than compound armor, and have indicated the probable superiority of nickel steel over simple steel.

In order that the Department might be in a position to take immediate advantage of the results of these very important experiments, by substituting nickel-steel for simple steel armor on ships now building and authorized, Congress was at once requested to appropriate \$1,000,000 for the purchase, at the discretion of the Department, of nickel ore.

This appropriation having been made, the Department stands ready to adopt nickel-steel armor should further trials conclusively prove its superiority.

It may be confidently anticipated that nickel-steel will enter into the composition of projectiles, both common and armor-piercing, of gun-barrels for small-arms and later in the material used in the construction of artillery of large calibers.

The report of the Armor Board will be found in the appendix.

MISCELLANEOUS ARMOR TESTS.

The Bureau has had under consideration, in an experimental way, for some months past the development of a process of superficial carbonization of low steel or iron, invented by Mr. H. A. Harvey, of Newark, N. J. A number of experimental plates and other articles have been treated by this process and a quantity of tool steel has been thoroughly tested by the Bureau with extremely interesting results.

One plate about 2½ feet square and 6 inches thick was carbonized in a gradually decreasing amount to a depth of 3 inches, and subjected to a comparative ballistic test by the attack of a 6-pounder Hotchkiss projectile, with a similar plate, untreated. The resulting penetration in the untreated plate was about 3 inches. In the carbonized plate it was nil, the projectile being completely shattered.

In view of these results, which were reproduced and corroborated by further experiments, the Bureau has ordered an untreated armor plate 8 feet by 6 feet by 10½ inches, and proposes to have erected at the Washington navy-yard the necessary plant for treatment by the Harvey process. It will then be subjected to a ballistic attack with the 6-inch gun, and a comparative study made with the effects upon the foreign plates recently tested at Annapolis.

The object of the experiments, as will be apparent, is the development of an armor plate which shall possess a superficial hardness and the toughness inherent in all steel, or one of its alloys.

REDEMANN-TILFORD PROCESS.

The Bureau has also experimented with the Redemann-Tilford process of treating steel, which, it is claimed, likewise adds carbon to low mild grades of metal. The results were, however, not definitely successful. The Department has accepted an offer of the owner of this process to present a larger plate for further ballistic test.

RANGE-FINDERS.

The Fiske range-finders installed on the Chicago and Baltimore have been but partially tested, and the Bureau has ordered an extended trial of their value to be made with the instruments on board these vessels.

The results of these trials will be awaited before further issue of this device to the service.

THE WORKING OF GUNS AND CARRIAGES BY PNEUMATIC PRESSURE.

The tests of the 8-inch gun-carriage submitted to the Department by the Pneumatic Gun-Carriage and Power Company having shown, in the opinion of the naval board having charge of the trial, that it was inferior to the 8-inch gun-carriage designed and manufactured by the Bureau, some alterations of a minor character have been made by the company, and a further trial will shortly take place at the Naval Ordnance Proving Ground at Annapolis.

The construction by the company above mentioned of the pneumatic machinery and apparatus for controlling the 10-inch guns of the *Terror* has continued at the South Boston Iron Works under the inspection of Capt. E. O. Matthews, U. S. Navy.

The Bureau does not consider that this system of the control of the recoil possesses any advantages over the hydraulic principle adopted with marked success.

NAVAL MAGAZINES.

The Department has been obliged to abandon the naval magazine at Ellis Island for purposes and uses of the Treasury Department in connection with the landing of immigrants.

The act of Congress approved April 11, 1890, appropriated \$75,000 for the purpose of purchasing a new site and to erect the necessary buildings thereon. A desirable site has been selected at Dover, N. J., the same being a portion of the territory acquired by the Ordnance Department of the U. S. Army, and preliminaries to acquire the site in question have been instituted.

The position is well adapted for ordnance purposes, it being at a distance inland and thus sheltered from attack by a possible enemy on the water, and is in direct communication with the port of New York by rail.

The Bureau proposes to have a store vessel, to be anchored in the bay of New York, in a safe position, of sufficient capacity to contain the explosive supplies of a small number of vessels.

At present the Bureau has received courteous permission from the War Department to place its stores of explosives at Fort Wadsworth, New York Harbor. These magazines are, however, unsuitable for our purposes on account of dampness, and it is desired to have these stores removed elsewhere at as early a date as practicable.

The site of the magazine at Craney Island, near Norfolk, has become

untenable through the advances of the sea and through the deterioration of the sea-walls. The approaches are also rapidly filling up, and it is but a question of a very short time before it will be impracticable to approach the wharf with vessels of any draught above 4 feet. Extensive repairs are also needed to the wharf.

Further, the site is greatly exposed to attack from an enemy on the water and the buildings with their contents could be destroyed without any difficulty whatever by the enemy's vessel which had passed the outer land defenses.

The Bureau, therefore, recommends that this site be abandoned and that a new magazine be built at a station which shall be selected near Norfolk, where the necessary conditions for defense and accessibility are more advantageous. The necessary estimates for this expense are submitted in the Annual Table of Estimates.

The Department having been informed by the Treasury Department that the present location of the powder magazine at Sitka, Alaska, is dangerously near the custom-house, and having been requested to remove the powder and ammunition therein stored to a safe distance, an estimate has been inserted for the amount necessary to construct a new magazine.

NAVAL TORPEDO STATION.

The Naval Torpedo Station is at present under the charge of Commander T. F. Jewell, U. S. Navy.

The Bureau proposes in the near future to carry on at this station a large amount of important work in the development of explosives and experimental torpedoes, of both American and foreign invention.

In preparation for this work and on account of pressure for time, owing to the chemical and physical investigation of a large number of inventions in the direction of high explosives, the usual class of officers has not been ordered for instruction to this station during the past year.

The status of the War College has also rendered this impracticable.

I suggest for your consideration the evident advantages of discontinuing this class at the Naval Torpedo Station.

It seems clear that it will be to the advantage of the Department that the Bureau possess a station which shall be devoted exclusively to experimental and manufacturing work, as it has not proven useful to carry on both an educational institution and a manufacturing establishment and such other work as above described at the same time in the same place.

It will be appreciated that the Department has in the near future an enormous amount of experimental research to look forward to, and this must be done somewhere. The Bureau proposes, therefore, to increase the manufacturing plant at the torpedo station, to augment the corps of assistants, and to endeavor to achieve results from domestic sources of a character commensurate with the importance and necessities of the new armament.

WAR COLLEGE.

The War College, at present in charge of the Bureau of Navigation, being in the immediate vicinity of the torpedo station, the plant, apparatus, and work done at the latter will be accessible to those under instruction at the War College, and every facility will be given to them in the prosecution of their studies.

A synopsis of the work of the torpedo station during the past year is appended.

INSTRUCTION OF ENLISTED MEN.

The instruction of enlisted men in ordnance work and practical electricity has continued at the Washington Gun Factory and at the Torpedo Station, Newport, R. I.

The average number under instruction during the year has been twenty-five at the gun factory and twenty-seven at the Torpedo Station.

It is considered that this course of instruction is of the greatest value to the naval service, and the Bureau hopes that the adoption of the valuable suggestions in regard to it contained in the reports of Commanders T. F. Jewell and Charles O'Neill, U. S. Navy, will still further systematize and improve it.

The following statements are appended, viz :

- A.—Statement showing the amount appropriated under each specific head of appropriation for the service of the Bureau of Ordnance during the fiscal year ending June 30, 1890, expenditures during the same period, and balance remaining on hand June 30, 1890.
- B.—Statement of the number of days' labor and cost thereof from July 1, 1889, to June 30, 1890, at the respective navy-yards and stations chargeable to the Bureau of Ordnance.
- C.—Amounts expended during the fiscal year ending June 30, 1890, from the appropriations under the Bureau of Ordnance, for civilians employed on clerical duty or in any other capacity than as ordinary mechanics and workmen.

I am, sir, your obedient servant,

W. M. FOLGER,
Chief of Bureau.

Hon. B. F. TRACY,
Secretary of the Navy.

REPORT OF THE CHIEF OF THE BUREAU OF CONSTRUCTION AND REPAIR.

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THE WOODEN VESSELS OF THE NAVY.

With the gradual appearance of the new steel navy has come the rapid retirement of the wooden fleet.

When the *Chicago*, *Boston*, *Atlanta*, and *Dolphin* were begun the serviceable wooden steam-vessels numbered, in all, thirty-seven; now there are eleven new steel vessels and one first-class torpedo-boat in commission and only eighteen wooden steam vessels.

In about seven years the wooden fleet will have practically disappeared, or have been utilized as receiving and training vessels.

At present we have of the second-rates the *Lancaster*, *Pensacola*, and *Omaha*. The third-rates are the *Scatara*, *Galena*, *Marion*, *Mohican*, *Iroquois*, *Kearsarge*, *Adams*, *Alliance*, *Essex*, *Enterprise*, *Nipsic*, *Tallapoosa*, *Thetis*, and *Yantic*. The *Dispatch* is the only fourth-rate now in existence.

The work of repairing the *Lancaster* for a gunnery training-ship, which was not begun till late in the fiscal year, did not progress rapidly, for the condition of the appropriation would not permit of the expending of a sum sufficient to carry on the work expeditiously. Since the 1st of July the work has been pushed and she is now rapidly approach-

ing completion, and, with a battery of modern guns, will make an excellent gunnery training vessel. With her new boilers she can probably remain in service from eight to nine years.

The *Pensacola*, having been repaired and had new boilers placed in her, will probably last from four to five years longer.

The *Richmond* has been ordered to Newport for duty in connection with the training-station. She is now practically unserviceable for duty as a cruising man-of-war.

It is doubtful whether the *Omaha* will be worth repairing on return from present cruise.

The *Scatara* has been ordered to the navy-yard, Mare Island, and with slight repairs can probably continue in active service two or three years, at the expiration of which time, in the opinion of the Bureau, she can not be again repaired under the law.

The *Galena*, if repaired can be continued in service five or six years.

The *Marion*, when repairs are completed, will last about five years. The *Iroquois* and *Kearsarge* will last about two or three years. Having returned from her cruise in the Pacific, the *Adams* has been surveyed by the statutory board, the estimate for repairs to her hull being \$27,910. If this vessel is repaired she will continue in service five or six years longer.

The *Alliance* and *Thetis* may last three years, and the *Yantic* five or six years. The *Mohican* should last five years. The *Essex*, having been thoroughly repaired and having new boilers, will last five or six years longer. The *Enterprise*, having been overhauled at the navy-yard, New York, is probably good for three years longer. At the expiration of that time she will probably be condemned. Repairs were made on the *Nipsic* at Honolulu, sufficient to enable her to continue her cruise; at the present time she is at the navy-yard, Mare Island, and as the report of survey shows that it will cost \$23,945, the Bureau is doubtful as to the expediency of repairing her. The *Tallapoosa* can not be repaired under the law, and will probably not be able to continue in service more than eight months. The *Dispatch* will probably last only a year, unless extensive repairs are made upon her.

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NEW SHIPS OF THE NAVY.

The description which follows of new ships building or to be built for the Navy will show the great advance made in ship design and in the ship-building capacity of the country in the last five years. The vessels are the outcome of the conditions due to our coast line, our ocean commerce, and our position as a nation.

In the opinion of this Bureau the ideal commerce-destroyer has been attained in the design of cruiser No. 12. She has a sustained speed greater than that of the swiftest of the Atlantic "greyhounds," united with a powerful battery, immense coal endurance, and efficient protection.

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ARMORED CRUISER NO. 2.

This ship was authorized by the naval appropriation act approved September 7, 1888, which provided, under the head "Increase of the Navy," for "one armored cruiser of about seven thousand five hun-

dred tons displacement, to cost, exclusive of armament, not more than three million five hundred thousand dollars."

Under date of April 8, 1890, bids were advertised for, and a circular to bidders issued defining the chief characteristics of the vessel.

Bids were opened June 10, 1890, and the contract for the vessel awarded to the Wm. Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa.

The contract provides for the completion of the vessel by January 1, 1893.

Below are given the principal dimensions, etc., of armored cruiser No. 2:

Length on water-line	380 feet 6½ inches.
Breadth, molded	64 feet.
Draft, mean	23 feet ¾ inches.
Displacement corresponding	3,150 tons.
Maximum speed	20 knots.
Sustained sea speed	18.5 knots.
Complement (officers and men)	475
Endurance on total coal capacity (estimated)	12,000 miles.

The vessel has four complete decks, including the protective deck, and a large flying deck or bridge, upon which are carried the boats.

She has no sail power, but carries two military masts fitted with double fighting tops. Her freeboard to upper deck is about 20 feet, and this, together with her size, will enable her to fight her guns and maintain her speed in a sea which would render smaller ships practically helpless.

Scantlings and general construction.—The vertical keel is 20 pounds per square foot, with lower angles 4½ by 3 inches of 13 pounds per foot, and upper angles 4 by 3 inches of 10 pounds per foot.

The outer flat-keel plates are 25 pounds per square foot, and the inner 23 pounds per foot.

The stem, stern post, and shaft struts are to be made of cast-steel, and the rudder frame a combination of forged and cast steel.

The transverse frames are spaced 4 feet apart within the machinery space and 3½ feet forward and aft of this space.

Within the double bottom the ordinary frames have a continuous frame angle 6 by 3½ inches of 12 pounds, continued through the margin plate, and intercostal reverse bars 4½ by 3 inches of 10½ pounds. Connecting bracket plates are 15 pounds next the vertical keel and 12½ pounds elsewhere.

Water-tight frames have 12½-pound intercostal plates and staple angles 3 by 3 inches of 8 pounds.

From margin plate to protective deck the frame angle of 6 by 3½ inches of 12 pounds has a reverse angle of 5 by 3 inches of 10 pounds worked on it with 17½-pound gussets at head and heel.

Forward and aft of double bottom or machinery space, and below protective deck, the frames consist of continuous Z-bars, 6 by 3½ inches of 15 pounds per foot, with lower ends split for the admission of a 10 pound floor plate.

Above the protective deck the frames generally consist of Z-bars 6 by 3½ by 3½ inches of 15 pounds, continuous from protective deck to upper deck, with 15-pound gusset plates and 3½ by 3 inches of 9-pound angles at their heels.

Intermediate frames of the same scantlings as the above are worked between the protective and berth decks behind the side armor. There are three longitudinals on each side within the double bottom, composed of 17½-pound continuous plates slotted over the frame angles, with in-

tercostal outer angles and continuous inner angles, both 3 by 3 inches of 7 pounds.

Beams.—To upper deck, T-bulb 10 by 5½ of 31½ pounds. To gun deck, angle bulb 10 by 3½ inches of 26½ pounds. To berth deck, angle bulb 10 by 3½ inches of 26 pounds. To protective deck, angle bulb 10 by 3½ inches of 26.5 pounds. To platforms, angle or Z-bars 10 or 11 pounds, respectively.

The scantling of the deck beams given above are suitably reduced toward the extremities of the vessel.

The outer plating amidships is 23 pounds per square foot from keel plate to sheer strake, which is 46 pounds. Towards the extremities the outer plating is 20 pounds and the sheer strake 30 pounds. The plating is doubled between the protective and berth decks in wake of the thin armor, and doubling plates are worked in wake of gunports where exposed to chafe of the anchors, etc. The flat keelson plate is 15 pounds per square foot. The remainder of the inner bottom is generally 12½ pounds per foot. The margin plate is 18 pounds, and the three strakes on each side directly above the longitudinals are 14 pounds.

The main transverse and longitudinal bulkheads below the protective deck have plating 15 pounds per square foot for the lower strake, 12½ pounds for the next two strakes, and 10 pounds for the remainder. The minor bulkheads below the protective deck and between the protective and berth deck have generally 10 and 8 pound plating, and the bulkheads, casings, etc., above the berth deck are 7½ pounds.

The upper deck has 22½-pound stringer plating and a complete steel flat of 10 pounds. The gun-deck stringers are 17½ pounds, and ties 15 pounds. This deck is completely plated towards the extremities with 10-pound plating.

The berth deck has 15-pound stringers, and a complete steel flat of 7½ pounds.

The yellow-pine wood flats have the following thicknesses: Upper and gun decks 3 inches, berth deck 2½ inches.

Hull protection.—The buoyancy and stability of the ship are protected by: (1) A complete protective deck. (2) A partial belt of armor. (3) A complete belt of water excluding material.

The protective deck at the sides is 4 feet 9 inches below the water amidships and 1 foot above the water when the vessel is at the mean draught of 23 feet 3½ inches.

It is completely covered with two courses of plating having a thickness of 3 inches amidships and 2½ inches forward and aft. The slopes amidships are covered with an additional thickness of 3 inches, making their total thickness 6 inches.

In wake of the machinery spaces a belt of thin armor is worked between the protective and berth decks. The total thickness of metal on the side throughout this space is 5 inches.

A coffer-dam 3 feet 6 inches deep is worked between the protective and berth decks, and extends completely around the ship. It is filled with an approved water-excluding material.

A large proportion of the coal supply is stowed on the armor deck, forming an additional safeguard against the effects of damage near the water-line.

Battery and its protection.—The ship carries six 8-inch B. L. R., twelve 4-inch R. F. G., eight 6-pounder R. F. G., four 1-pounder R. F. G., four Gatling guns, and six torpedo-tubes.

Of the 8-inch guns, two are mounted in a barbette forward on the

upper deck, and two in a similar barbette aft, while the remaining two are carried in broadside amidships on the upper deck.

The barbettes are 10 inches thick, and the revolving conical shields on the guns 7 inches. The sloping armor between the upper and gun decks beneath the barbettes is 5 inches thick and the ammunition tubes below are also 5 inches.

The 8-inch guns on the broadside are protected by partial barbettes 2 inches thick and shields on the guns.

The 4-inch R. F. G. are mounted on the gun deck in armored sponsons 4 inches thick, and have shields on the guns closely covering the ports. Their protection is further assured by 1-inch splinter bulkheads.

The 6-pounder guns are protected by 2-inch armor or its equivalent.

There is one fixed torpedo-tube in the bow, one fixed in the stern, and two training on each broadside—all above water.

The 8-inch guns are 25 feet, and the 4-inch guns 16½ feet above the water.

Machinery.—The vessel has twin screws, driven by four vertical, inverted, direct-acting, triple-expansion, three-cylinder engines, arranged in four water-tight compartments. The cylinder diameters of each engine are 32, 46, and 70 inches, respectively, and the stroke 42 inches. The air and circulating pumps are driven independently. There are four main condensers of composition and sheet brass, each having about 5,560 square feet of cooling surface, and two auxiliary condensers. It is estimated that the total collective I. H. P. of propelling, air-pump, and circulating-pump engines should be 16,000 when the propelling engines are making 129 revolutions per minute.

There are six double-ended, eight-furnace, horizontal-return, fire-tube main boilers, arranged two abreast in three water-tight compartments, with six thwartship fire-rooms. They are about 15 feet 3 inches external diameter, and 21 feet 3 inches long. Their working pressure is 160 pounds, their total grate surface is about 990 square feet, and total heating surface about 31,190 square feet.

There are two auxiliary single ended, two-furnace boilers placed above the protective deck. They have a total grate surface of about 64 square feet, and heating surface of about 1,937 square feet.

All the boilers are fitted to be worked under forced draught on the air-tight fire-room system.

The arrangement of the engines is such as to show great economy at low speeds, and it is estimated that on the total bunker capacity of 1,500 tons of coal the vessel will have an endurance of about 13,000 miles at a speed of 10 knots.

Miscellaneous.—The vessel has a complete electric-lighting outfit, arranged in accordance with the most recent practice in the service.

There are fittings for artificial ventilation throughout, and the living quarters have excellent natural ventilation as well.

Great care has been taken to make the pumping and drainage arrangements thorough and efficient.

The vessel is fitted as a flag-ship in addition to the quarters of admiral and captain, and there are state-rooms for twenty ward-room officers, twelve junior officers, and two warrant officers.

The usual officers' store-rooms, etc., are provided, and the quarters for the crew are roomy and comfortable—in fact, the size and type of the vessel are such as to make the accommodations throughout unsurpassed for spaciousness and comfort.

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HARBOR-DEFENSE RAM.

Plans have been completed for a twin-screw, armor-plated, harbor-defense ram, upon the design of Rear-Admiral Ammen, U. S. Navy, authorized by act of Congress March 2, 1880.

The principal features are:

Length over all	feet..	243
Length on load water-line	do..	242½
Breadth, extreme	do..	43½
Breadth at water-line	do..	41½
Depth amidships	do..	15
Displacement	tons..	2,050
Indicated horse-power		4,800
Speed	knots..	17

The vessel is designed upon the longitudinal and bracket system, with an inner bottom extending from the collision bulkhead to the stern.

The longitudinals and girders supporting the deck are to be continuous, converging to the stem casting and to the stern, the frames and beams to be intercostal. The depth of longitudinals and vertical keel throughout their length to be 24 inches; the girders supporting the armored deck to be 15 inches. The vertical keel, two longitudinals, and armor shelf on each side of the vertical keel are to be water-tight, forming, transversely, 6 compartments, these being divided longitudinally by water-tight frames. By this means the space between the inner and outer skin is subdivided into 72 compartments.

The transverse and longitudinal bulkheads between inner skin and deck armor divide this space into 30 compartments, making a total of 102 compartments in the vessel.

The vessel is to be provided with a removable wrought steel ram-head, to be accurately fitted and securely held in position in the cast-steel stem.

Scantling.—The inner keel to be 17½ pounds; the out keel 20 pounds per square foot; the vertical keel 17½ pounds, with two 3½ by 3 inches of 8 pounds per foot angles at the top, and two angles 4 by 3 inches of 9 pounds per foot at the bottom, connecting it with the flat keel plates.

The flat keelson plates will be 15 pounds per square foot, the outside plating 15 pounds, and the inner plating ten pounds per square foot, respectively. The plates of the longitudinals are to be 15 pounds per square foot for the water-tight spaces and 12½ pounds per square foot for the remainder. Angles at top and bottom of these longitudinals to be 3 by 3 inches of 7 pounds per foot.

The main frame angles to be 3½ by 3 inches of 8 pounds per foot, reverse angles to be 3 by 3 inches of 7 pounds per foot. Angles to water-tight frames to be 3 by 3 inches of 7 pounds per foot. Floor plates to water-tight frames to be 10 pounds per square foot; all others to be 12½ pounds.

The bulkhead plates of 10 pounds per square foot are to be stiffened by angles 3 by 2½ inches of 6 pounds per foot.

Armor.—The outside strake of the deck armor is to be 6 inches in thickness, the next strake inboard to taper in thickness in its breadth from 5½ inches to 2½ inches, the remainder of the deck plating to be 2½ inches in thickness, including the lower course of plating.

The side armor to be two strakes in depth, the upper 6 inches in thickness, and the lower 3 inches to be secured by bolts with counter-sunk heads driven from the outside through wood backing of yellow

pine, and two backing plates, each 20 pounds per square foot, and set up with nuts on rubber washers.

All hatches through the armored deck to have battle plates, and the smoke-pipe and ventilators to have inclined armor 6 inches in thickness. The conning tower to be 18 inches in thickness.

Quarters for officers and crew.—The wardroom is on the after-berth deck just abaft the engine-room bulkhead, into which open seven state-rooms and a pantry; abaft the officers' quarters is a berthing space for a portion of the crew, the forward berth deck being designed entirely for the crew.

Machinery.—The engines are triple expansion and of the horizontal type, each engine being in a separate compartment. There are four cylindrical horizontal fire-tube boilers placed in two water-tight compartments.

The engines are to develop 4,800 horse-power under forced draught, with a corresponding speed of 17 knots.

Lighting, drainage, and ventilation.—There will be a complete installation of electric lights sufficient for lighting all parts of the vessel, and arranged in duplicate so as to guard against accident.

The drainage system to be so arranged that any compartment can be pumped out by the steam-pumps.

The vessel is to be submerged to fighting trim by means of fourteen 8-inch Kingston valves, one in each transverse water-tight compartment of the double-bottom, and sluice-valves will be fitted in the vertical keel and the water-tight longitudinals in these compartments.

The foul air to be exhausted from all parts of the vessel by means of blowers in engine and fire-rooms; the fresh air to be supplied from main ventilator through air-ducts led along the under side of deck forward and aft.

The only projections above the armor deck are the conning tower, smoke-pipe ventilators, hatch coamings, and skid beams upon which the boats are supported.

The vessel has no armament and is to rely entirely upon ramming for her offensive power. Advertisements for proposals have been issued, bids to be opened December 20, 1890.

I am, sir, very respectfully,

THEODORE D. WILSON,
Chief Constructor, U. S. N.,
Chief of Bureau.

HON. B. F. TRACY,
Secretary of the Navy.

REPORT OF COMMANDANT OF UNITED STATES MARINE CORPS.

HEADQUARTERS U. S. MARINE CORPS,
Washington, D. C., October 1, 1890.

SIR: In obedience to your order of September 2, 1890, I have the honor to submit the annual report of the conditions and wants of the U. S. Marine Corps.

On October 1, 1890, there were 1,950 men in the corps, 918 of whom were on board ships in commission, and 1,032 at the several shore stations, which include the sick and prisoners. During the past year there have been 948 enlistments, 85 re-enlistments, 19 re-enlistments from the Army, 16 deaths, 387 discharges, 520 desertions, and 3 enlisted men retired.

Owing to sickness the colonel commandant has been placed on waiting orders until his retirement January 29, 1891. One lieutenant-colonel and one captain have been retired for disability, one first lieutenant has resigned, and two first lieutenants have resigned to take effect December 22, 1890, and June 30, 1891. One major on the retired list and three first lieutenants on the active list have died. Five second lieutenants have been appointed from the graduates of the Naval Academy, and are now being instructed in their duties at the Marine Barracks, Brooklyn, N. Y.

The usual inspections by the adjutant and inspector of the different posts during the year show them to be in a satisfactory condition.

I would earnestly suggest the propriety of obtaining from Congress an appropriation for 200 or 300 more privates, as the vessels now built and being built are much larger than the old ones and consequently require more marines. I would also recommend that the number of second lieutenants be increased to twenty, the number now allowed by law being twelve, which is insufficient.

The number of men at the different shore stations is inadequate to perform the duties properly and to protect the Government property from fire and theft, and no doubt many of the desertions are caused by their being overworked in the performance of this duty.

The act of June 16, 1890, which provides for the retention of \$4 per month from the pay of all enlisted men during the first year of their enlistment, as well as the order of the Department directing the change from the Army to the Navy ration, will, in my opinion, prevent many desertions.

I have been informed by the quartermaster of the corps that all the public buildings under his charge at the several navy-yards are in better condition than ever before. The barracks at the navy-yard, Norfolk, Va., has progressed so far as to justify the belief that it will be ready for occupation by December 1 next. The necessity for erecting officers' quarters at this navy-yard will be apparent when it is considered that at the present time the marine officers attached to that command live quite a distance from the troops at an annual expense to the Government of over \$2,000, a condition of affairs which should not exist.

The Marine Barracks at Mare Island, Cal., which was erected in 1864, requires considerable repairs, and \$3,000 has been included in the estimates for the coming fiscal year to be used for that purpose.

An appropriation has been made for the erection of a marine bar-

racks, at Sitka, Alaska. At present the marines are mustered as attached to the U. S. S. *Pinta*, though in reality they are quartered on shore in what is known as the naval guard-house, and performing regular post and garrison duty. A portion of land has been set apart by a board appointed by the Treasury Department to be used as a site for a marine barracks, and plans upon which to erect the same have been prepared by Capt. F. H. Harrington, commanding the marines at the above-named place, and it now remains for the Navy Department to issue the necessary instructions for the transfer of this parcel of land to the Marine Corps, when steps will be taken to commence the erection of the barracks.

I earnestly call the attention of the Department to the necessity for the erection at these headquarters of a suitable fire-proof building for use as offices of the commandant and staff, the one now in use being a small frame structure without vaults or other means of protection against fire. There are many valuable papers contained therein, the destruction of which would greatly embarrass the Government in the settlement of the accounts of officers and enlisted men, as well as obtaining evidence of services necessary in pension cases.

A copy of the usual estimates for the support of the corps for the coming fiscal year was forwarded to the Department September 25, and the duplicate is herewith inclosed.

Very respectfully, your obedient servant,

O. D. HERR,
Colonel, U. S. M. C., Commanding.

Hon. B. F. TRACY,
Secretary of the Navy.
Washington, D. C.

ANNUAL REPORT OF THE SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., November 1, 1890.

SIR: This report will summarize the work of the Department of the Interior for the past year and exhibit to some degree the great responsibility devolving upon the Secretary, and the almost incessant labor required in supervising and directing the varied national affairs submitted, under you, to his control.

It has been a year of much executive achievement in all the bureaus of this Department.

From the public domain a new Territory has been formed and organized; former Territories have advanced to States; four, admitted to the Union last year, have obtained full representation in both houses of Congress; and two more, admitted this year, have elected their State officers and are about to choose their national representatives. No small part of the satisfaction and good feeling of the people of the States of Washington, Montana, North Dakota, South Dakota, Idaho, and Wyoming, exhibited at their most recent elections, is known to be due to the liberal and just execution of the land laws, the pension laws, and the sympathetic interest of the officers of the General Government in the rights and welfare of the Western settlers.

As Territorial organizations have changed into permanent State governments, so "Oklahoma" has become a Territory by act of Congress approved May 7, 1890, and is shown by the census of 1890 to have over 50,000 inhabitants.

And again, while this Territory has been forming, great additions from the Indian reservations have been made to the public domain soon to be opened to settlement. The various Indian commissions have made agreements, now awaiting Congressional action, with different tribes for many millions of acres.

This formative period is one of intense interest not only to our law-makers and constitutional rulers but to our whole people as they view the present and prospective great increase of States over which the National Constitution continues to expand, and this period will hereafter, it is believed, be found to have been one during which the Republic's vitality and stability were very severely tested. The line of States is

now, however, continuous across the continent and from Canada to Mexico, and yet no weakness in government has been found to arise from the distance at which its power must be exercised; while the increase of the population over which it prevails tends only to make it stronger and more permanent.

There is presented in this report extended facts, comments, suggestions, and recommendations upon the subjects shown in the preceding table of contents of twenty-one separate bureaus, institutions, parks, etc., under control of the Secretary. This gives a bird's-eye view of the variety and importance of the affairs of the Department:

A table showing the force by which this work is done, under the supervision of the Secretary is annexed (Appendix A). It aggregates 16,120 persons.

The business of the different bureaus, institutions, Territories, and reservations are now to be dealt with in detail.

PUBLIC LANDS.

VACANT LANDS.

The vacant lands of the United States, exclusive of those in Alaska, at present extend over 586,210,861 acres, of which 282,772,439 are already surveyed.

Alaska contains 577,300 square miles, or 369,529,600 acres, of which not more than 1,000 acres have been entered. The aggregate reaches 955,746,461 acres. The following table exhibits this area by States and Territories, from official sources, as estimated:

Vacant lands in the public land of States and Territories.

State or Territory.	Surveyed land.	Unsurveyed land.	Total.	State or Territory.	Surveyed land.	Unsurveyed land.	Total.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Alabama	1,105,060	.....	1,105,060	Montana	9,611,315	55,195,312	64,806,627
Arizona	11,083,626	37,715,426	48,800,052	Nebraska	11,226,584	.....	11,226,584
Arkansas	4,062,329	.....	4,062,329	Nevada	27,316,167	23,483,372	50,800,539
California	38,780,564	15,172,154	53,952,718	New Mexico	39,699,806	10,699,320	50,399,126
Colorado	34,354,550	5,639,890	39,994,446	North Dakota	14,318,400	10,179,000	24,497,400
Florida	2,283,626	3,340,800	5,624,426	Oklahoma	22,653	73,672,649	73,695,302
Idaho	3,938,277	43,619,613	47,557,890	Oregon	38,372,982	14,804,246	53,177,228
Iowa	2,000	3,000	5,000	South Dakota	2,043,374	8,198,124	10,241,498
Kansas	755,791	.....	755,791	Utah	7,029,100	29,170,000	36,199,100
Louisiana	1,243,469	115,293	1,358,762	Washington	4,165,171	15,491,143	19,656,314
Michigan	832,707	.....	832,707	Wisconsin	819,329	.....	819,329
Minnesota	2,902,634	4,011,520	6,914,154	Wyoming	37,678,200	11,421,800	49,100,000
Mississippi	1,407,480	.....	1,407,480	Total	282,772,439	303,444,422	586,216,861
Missouri	1,151,463	.....	1,151,463				

* The unsurveyed lands in Oklahoma are in the Public Land Strip.

† This aggregate is exclusive of the Cherokee Strip, containing 8,044,844 acres, and all other lands owned or claimed by Indians in the Indian Territory west of the 96th degree of longitude, contemplated to be made a part of the public domain by the 14th section of the act of March 2, 1893 (28 Stat. 1005), and it is also exclusive of Alaska, of all lands in Indian reservations, and of all railroad land grants.

This table was especially prepared so that some approximate estimate may be made by those seeking homes, not only of the general extent of unclaimed lands but also in what particular States and Territories there is presented the opportunity for selection. Our Government has been lavish in its bestowment of the public lands upon States, Territories, schools, colleges, railroads, and individuals, but there still remains this immense empire to be occupied by the growth of our free and industrious population.

The policy of the Government has so long been such as to derive its means of support from other sources, that it has been possible to dispose of the public lands freely for the benefit of the people. This policy has been deemed by some too free and regardless of the future, but had it been otherwise the restraint upon the increase of States, upon the progress of improvement, upon the establishment of millions on their own homesteads, and upon the support of education, would have been incalculable, and the loss in competency, independence, and patriotism would have far outweighed the money value of the lands granted. The Republic strengthens permanently its most substantial resources when it converts its wilds into homes, establishes upon the vacant national domain new Territories and maintains them until they come into the Union as prosperous States.

The policy of the Department has been continued, as the Secretary's last report shows it to have been begun, under the present administration, in giving a liberal interpretation to the land laws in favor of the settlers and by advancing, as far as can reasonably be done, the early decisions upon all entries made, contested or uncontested.

The following facts exhibit the success achieved in accomplishing these purposes:

It appears from the report of the Commissioner of the General Land Office that 19,000,000 acres of agricultural land were transferred to actual settlers during the past year, embracing those upon final and commuted homestead entries, pre-emption, timber culture, desert, private cash, town-site, and all other entries for strictly agriculture non-mineral lands.

The lands patented to States, for education, internal improvements, and public buildings have exceeded 300 per cent. over the previous year, amounting in 1890 to 539,779.84 acres.

The patents issued for the year ending June 30, 1890, numbered 117,247, as against 70,141 the preceding year, or an increase for the last year in patents of 47,106, and in land of 7,536,960 acres, the patents for 1890 covering 18,759,520 acres; those for 1889, 11,222,560.

In addition to these there was an increase of 494 in mineral and mill-site patents issued in 1890, those for 1890 being 1,407; for 1889, 913. The area of coal lands granted in 1890 nearly doubled that of the previous year. In 1890 there were 224 patents, covering 33,473 72 acres, and in 1889, 155 patents, covering 17,096.80.

The swamp land patents to States amounted to only 100,351.89, which is a decrease from preceding year of 150,369.56 acres.

The railroads have also received patents for 61,183.87 acres less than last year; 363,862.15 for 1890 against 425,046.02 in 1889, of which 281,773.01 acres were in Minnesota, and the remainder in Iowa, Louisiana, and Wisconsin.

Besides there were patents to Indians for lands in severalty, and miscellaneous claims for 109,056.02 acres.

On June 30, 1890, there were 208,064 final entries of all kinds pending, as against 276,751 on June 30, 1889, a decrease during the last year of 68,687 entries. The financial results have been quite satisfactory, the total receipts from public lands being \$7,470,370.31. On reference to the Commissioner's report it will be observed that over four times as many acres were sold under pre-emption entries as any other kind, amounting, indeed, to two-thirds of all the sales.

RAILROAD LAND GRANTS.

The following figures, taken from the Commissioner's report, show the lands claimed by the subsidized railroads and other corporations. There were certified or patented up to 1890:

	Acres.
For railroad purposes (1850 to 1890)	51,379,346.21
For wagon-road purposes (1824 to 1890)	1,732,730.83
For canal purposes (1828 to 1890)	4,424,073.06
For river improvements (1828 to 1890)	1,406,219.60
	<hr/> 58,942,369.90

But during the last fiscal year there were but 363,862.15 acres patented, and these were for railroads only.

Previous to June 30, 1890, the number of miles of such roads built was 18,070.71; but during the last year only 40 miles were completed, and but one map of location was filed, being that for Southern Pacific Railroad, for 20 miles west of Haron, in California.

The pending lists yet unacted upon are:

	Acres.
For railroads	29,471,702.03
For Oregon wagon-roads	305,246.67
Total	<hr/> 29,776,948.70

The cause of inaction upon these lists, as explained in the last annual report, was from doubt whether Congress would endeavor to forfeit the lands of those roads that were not built within the time provided in their respective grants.

The subject was presented to Congress in your first message, and Congress has acted upon it, to the extent of declaring a forfeiture of all those lands heretofore granted that are coterminous with any unconstructed portion of the route. The act is entitled, "An act to forfeit certain lands heretofore granted for the purpose of aiding in the construction of railroads, and for other purposes," and was approved September 20, 1890.

While this subject was under consideration by Congress, each branch thereof took action in relation thereto by resolutions addressed to the Secretary, and to which he gave, it is deemed, satisfactory replies, as no legislative action was taken to interfere with or defeat his announced purpose.

A large part of the lands granted to railroad companies has passed into the hands of purchasers from the railroad company and are now inhabited and cultivated by them. The question as to these has practically ceased to be one between the Government and the railroad companies, and become one between the United States and its inhabitants, and should be dealt with accordingly.

The act of September 29, 1890, should be enforced, but the mineral lands reserved by the terms of the grant should be carefully identified and preserved as a part of the public domain for the benefit of the people.

PRIVATE LAND CLAIMS.

The subject of private land claims in Arizona, New Mexico, Colorado, Florida, and California is very fully and carefully presented in the Land Commissioner's report.

The surveyor-general of Arizona, in October, 1889, reported the claim of Don Miguel de Peralta for almost 5,000,000 acres to be a forgery and fraud. In February, 1890, the Commissioner of the General Land Office passed upon the validity of the claim, and concluding it to be invalid struck it from the docket. An appeal from this order having been taken to the Department, the legality of the action can not be discussed here. It may, however, be noted that this course has kept the vast area included in the claim open to settlement pending the controversy, subject, of course, to any possible decision in favor of the claimant. But if the claim is finally denounced the advantages to settlers of the present action will be very great. Had it been by the Commissioner merely adjudged unfounded, and reported to Congress under the act of 1854, none of the land could have been held open to entry, as it was therein provided that reports by the Commissioner should be laid before Congress, and until final action thereby all lands covered by the claim should be reserved from the sale or other disposal of the Government, and should not be subject to the donations granted by that act.

This is but an exemplification of the difficulties arising under the present condition of private land claims, and the great need of legislation of the character now pending before Congress. Reference is made to the bill entitled "A bill to establish a United States land court and to provide for the settlement of private land claims in certain States and Territories." (Senate 1042, as reported from committee.) This measure has been well considered by the Secretary and is deemed most desirable.

In this connection another matter of great importance should be mentioned as worthy of immediate attention by Congress. It is discussed

in the report of the surveyor-general of New Mexico and referred to in that of the Land Commissioner. The facts taken from these reports may be thus summarized. The population of New Mexico when acquired by the United States was 80,000, and some of the wealthy held large tracts of land, but the people were, for the most part, very poor. From the days of Charles V of Spain to the annexation, wherever it was thought proper to found settlements, the viceroys and residents gave, in the name of the Emperor, lands, house-lots, and waters, in conformity with the disposition of the land. Under the Republic of Mexico the colonization laws and regulations became a very complete system, well adapted to the people and the country, and were intended to bestow upon each one without land a portion of the public domain. Because of the system of irrigation practiced, the lands cultivated, sloping down the hills, were of irregular shape and apt to be separated by divisions among heirs and subsequent union of ownership of separate parcels by marriage, without consolidation of the tracts themselves.

This prevents entries now of these tracts under the existing land laws of the United States, because the lands are not deemed to be according to our system of surveys and the claimants do not reside on many of the tracts cultivated. The surveyor-general continues as follows:

The owners of all the farm lots up and down the river live together about the plaza, in which they can quickly rally in case of an Indian attack, the regulations requiring every man to be supplied with arms and horses for the common defense. Unitedly they dig the acequia and do other work for the common good; unitedly they rear the village church and maintain its worship. Sometimes the settlement was established by a formal grant, which gave to it also the land for ten or twenty miles on either side of it. In such cases it is specified that this is for the common benefit of the settlers, by furnishing them pasture-land and woodland, and for those who should afterward join themselves to the new settlement.

The idea of the Mexican people always was that the large tract gave the settlement room to grow, and that any new comer or boy becoming of age who wanted a piece of land out of the common stock to cultivate could have it, and could go on to improve it by taking out a new ditch or otherwise.

In view of these facts I think that every one living in this community at the time that it was transferred to the United States had a certain interest in the outlying lands, and that they did not belong exclusively to the heirs or assigns of the one or more settlers mentioned in the original papers. I also think that every member of such a community, no matter how poor he may be, was included in the provisions of the treaty of Guadalupe Hidalgo, that Mexicans electing to become citizens of the United States "shall be protected in the free enjoyment of their liberty and property." In order to protect them in their property in land, and to avoid taking it away from them and throwing it into the mass of its own property, the public domain, it was necessary for the United States to determine what the property of each one was. This should have been done at once. As it was not done, and matters were allowed to drift along in the old way, I consider that the Mexican custom as to the rights of new comers who joined themselves to a community, continued to run, and that every person now holding land on a grant made under the colonization laws has an interest in the outlying lands of the grant.

The question as to what each man owns should be settled at once. The whole prosperity of New Mexico depends upon it. The gravest evils have already resulted.

Supposed interests in community grants have been bought up, and under them large tracts have been fenced and poor men have found themselves substantially shut up to their farm lots and thereby reduced to the greatest distress. While they could get a living from the farm lot, combined with the herd of goats and sheep living on the common pasture, and with the privilege of the common timber-lands, they can not get it from the farm lots alone. The result is widespread suffering, restlessness and trouble, which threatened the peace of the community.

I think the remedy for this is surveys, combined with authority given the land offices to issue patents to each man for what belongs to him. The deputy surveyor's going to such a community and telling the people that he has come to assist them in getting title to their homes, would be rendered every assistance. Let every farm lot of long occupancy be surveyed and shown on the township plat as belonging to its owner. Then if it be an unconfirmed community grant with outlying lands, assign to each one a wood lot, say of the same size as his farm lot, in payment for his inchoate right in these outlying lands. Lands that could be made very valuable can not be left as unfenced commons for the benefit of a few goats and cattle.

The system that was adapted to the old time and the needs of a sparsely settled community must now pass away and be replaced by the American plan of individual ownership and inclosed lots, and the sooner the Government makes the inevitable change, the better it will be for all concerned.

After the plat goes to the register, the indications of ownership thereon should be subject to contest by anyone claiming the same land, in the manner that entries are now.

But there would be but few contests. The ownership of lots in this country is well known, and universally acquiesced in, with rare exceptions. Long continued occupation, with the consent of the Government and all parties interested, constitutes as just a claim as property is held by anywhere. A settlement of these matters in accordance with justice will be a permanent settlement and will be the best for the Government, and best for all interests in New Mexico.

Certain title to the land is the foundation to all values. Enterprise in this Territory is greatly retarded because that foundation is so often found lacking.

These views are deemed wise and timely, and are earnestly recommended to your favorable consideration. The commotions in New Mexico have been somewhat serious already, and the subject needs careful treatment to avoid graver difficulties. Our laws should be so administered as to preserve to the inhabitants their just claims to small holdings, at least in so far as their ancestors enjoyed them under Spanish and Mexican rule.

In reply to the resolution of the Senate, the Secretary transmitted a list of the private land claims and other information in connection therewith.

SURVEYS OF PUBLIC LANDS.

The act of March 2, 1889, appropriated for the survey and resurvey of the public lands for the last fiscal year, \$200,000; but \$20,000 of this was authorized to be applied to the examination of surveys; \$10,000 for lands opened for settlement in Montana, under act of May 1, 1888, and \$5,000 for west boundary line of the White Mountains in the San Carlos Indian Reservation in Arizona. This left \$165,000 for apportionment among the twelve surveying districts. The statute expressly required that preference should be given in favor of surveying town-

ships occupied in whole or in part by actual settlers, and that the surveys should be confined to lands adapted to agriculture and to lines of reservations. Special amounts out of the reserve were subsequently apportioned to Louisiana and Nevada. The surveys accepted during the year were for the following areas:

States and Territories.	Acres.	States and Territories.	Acres.
Arizona.....	597,748.27	Nebraska.....	23,020.41
California.....	162,631.41	Nevada.....	645,675.23
Colorado.....	473,457.72	New Mexico.....	297,131.73
Dakota.....	920,003.25	Oregon.....	84,706.67
Florida.....	2,519.33	Utah.....	676,323.66
Idaho.....	22,148.58	Washington.....	180,122.70
Minnesota.....	144,855.29		
Montana.....	620,161.43	Total.....	4,642,661.94

PUBLIC SURVEY APPORTIONMENT FOR 1891.

The apportionment of the appropriation made by act of 1890, has been made as follows:

	Amount apportioned out of \$425,000 appropriated for surveys year ending June 30, 1891.		Amount apportioned out of \$425,000 appropriated for surveys year ending June 30, 1891.
Arizona.....	\$5,000	New Mexico.....	\$10,000
California.....	10,000	North Dakota.....	40,000
Colorado.....	15,000	Oregon.....	20,000
Florida.....		Utah.....	5,000
Idaho.....	20,000	Washington.....	65,000
Louisiana.....		Wyoming.....	20,000
Minnesota.....	10,000	Reserve fund.....	37,000
Montana.....	75,000	Examinations.....	40,000
South Dakota.....	40,000		
Nevada.....			435,000

An interesting summary of the chief recommendations made in their reports by the surveyors-general is presented by the Land Commissioner's report. Some of these are the same as were dwelt upon in the last report of the Secretary, particularly as to making by executive order the south boundary of the White Mountain Indian Reservation a straight east and west line, cutting off from the reservation the coal-fields, but on such terms as will secure for the Indians a fair compensation, and that in California and elsewhere the deposit system of surveys be conducted under the most careful supervision, and that the present suits for fraudulent surveys be prosecuted with the utmost vigor.

FLORIDA PHOSPHATES.

Florida has suddenly presented new claims for both a topographical and geological survey, because of the discovery of extensive beds of phosphate rock; and also that sugar farms may be successfully established upon lands reclaimed by drainage.

As is hereafter shown, the State makes claim to these wet lands and is pressing for its adjustment independently of all previous allowances. The phosphate rock is, however, mineral, and comes under the general laws applicable to mineral lands. The surveyor-general remarks as to phosphates:

Great activity has prevailed for several months past in various counties in Florida in prospecting and staking valuable and extensive deposits of the mineral known as phosphate rock, and at certain places the work of mining and shipping the substance is being conducted on a large scale. It can hardly be doubted that the discovery of these deposits in Florida, exceeding in extent and thickness all such beds previously known in the world, is an event destined to produce great increase of value not only in the mineral lands of the State, but the agricultural also. In the general effort to find and secure phosphate lands many have decided to proceed in accordance with the law of United States mineral lands, and are awaiting action by your Department in the premises.

This remarkable discovery of unsuspected wealth within a few feet of the surface in scores of townships has caused large numbers of men to explore the country geologically with spades and boring apparatus. By such means other useful substances are said to have been found, such as marl, kaolin, fossil guano, slate rock, mica-schist, mica, zinc ore, and sulphur, and specimens thereof have been submitted to the tests of the State chemist; showing that Florida ought long ago to have received the benefit of a thorough geological survey.

As to sugar farming, he says:

A very recent important agricultural development in this State is the establishment of sugar farms upon lands reclaimed by drainage. These sugar lands previously were vast watery areas of saw-grass growing upon deposits of pure muck of unknown depth. Of the quality of this material an eminent official chemist wrote of a sample that "it seems to equal the best potting mold, and partakes more of the character of a manure than of a soil." When drained and cultivated it produces from 30 to 40 tons of cane stalks per acre of a quality equal to the best raised in Cuba.

The unsurveyed portions of this State are said to include large areas of such land; and as its prospective value, which in past years was considered nothing, is now shown to be considerable, it is respectfully suggested that this office be authorized to take advantage of any season of unusual dryness to extend the lines of survey in that region.

ARID LANDS AND IRRIGATION.

While thus in Florida the surveys are needed for lands to be reclaimed by drainage, other and vast areas of our country are absolute deserts, to be reclaimed only by irrigation. The report of the surveyor-general of Idaho particularly calls attention to the necessity of further legislation as to the arid lands and water supply; but the subject is of present and growing interest not only to Idaho, but to Wyo-

ming, Montana, Utah, Nevada, Colorado, Arizona, New Mexico, and the Dakotas, and to large parts of other States.

Great modifications have been made in the laws of the United States since the last annual report and a short statement of the facts as to the cause and extent of this change will lead naturally to the recommendations it is thought should now be made to Congress. The Act of October 2, 1888, provided an appropriation for investigating the extent of the arid region, the segregation of the irrigable lands therein, and the selection of sites for reservoirs and other hydraulic work necessary for the storage and utilization of water for irrigation and the prevention of floods and overflows. The act then provided:

"And all lands which may hereafter be designated or selected by such United States surveys for sites for reservoirs, ditches, or canals for irrigation purposes, and all lands made susceptible for irrigation by such reservoirs, ditches, or canals are from this time henceforth hereby reserved from sale as the property of the United States and shall not be subject after the passage of this act to entry, settlement, or occupation until further provided by law: *Provided*, That the President may at any time in his discretion, by proclamation, open any portion or all of the lands reserved by this provision to settlement under the homestead laws."

This law being in an appropriation act did not secure that general attention its great importance deserved, and was apparently unknown to the inhabitants of those regions most to be affected by it. Yet the Director of the Geological Survey was proceeding with his duties under the act and notifying the Secretary of the Interior of the selection of many sites for reservoir purposes, situated in many States and Territories. While this action was in progress the constitutional convention of Idaho sent resolutions to the present Secretary, asserting that certain parties were endeavoring in Idaho to divert the waters of Bear River from its channel for use in Utah. The Secretary replied, quoting the law of October 2, 1888, and had this reply widely published, that its very strong provisions might become generally known; and soon thereafter instructions, made in pursuance of the Secretary's direction, were sent to the registers and receivers of the local land offices in the arid-land regions, and they were ordered as the statute required,

"To cancel all filings made since October 2, 1888, on such sites for reservoirs, ditches, canals for irrigating purposes, and *all lands* that may be susceptible of irrigation by such reservoirs, ditches, or canal, whether made by individuals or corporations, and that they should thereafter receive no filings upon any such lands. (Annual Report, Secretary of the Interior, 1889; (Noble,) pp. 23, 24.)"

This report itself was dated November 14, 1889. These instructions were meant solely to bring the attention of the people to the statute, without qualification, that had passed by the previous Congress, and to enforce it so decidedly that if it were distasteful its repeal might be obtained.

There was an effort made by some to maintain that the statute did not withdraw the irrigable portions of the arid lands from private entry; but upon the question being referred to the Assistant Attorney-

General assigned to the Interior Department and the Attorney-General also, they gave written opinions fully supporting the Secretary. These opinions are to be found in this year's report of the Commissioner of the General Land Office, pages 59-78. The opinion of the Assistant Attorney-General bore date May 24, 1890 (*ibid.*, p. 66), and that from the Attorney-General's Office the same day. (*Ibid.*, p. 62.) The advice of the officers of the Department of Justice had been asked because of the resolution of the Senate quoted below, and in order that the Secretary might be quite sure he was correct in his construction. The opinions were received in time to be presented to the Senate, in reply to that resolution passed May 3, 1890, which was as follows:

"Resolved, That the Secretary of the Interior be requested to inform the Senate what construction is placed by his Department upon the scope and effect of the reservation from sale and disposal of the arid lands under the provisions of the act above cited, and what instruction or orders, if any, have been issued or made thereunder (whether general or special) with respect to the suspension of the arid lands from entry under the public land laws, or the suspension of entries thereof heretofore made, or affecting the rights of citizens to construct canals and ditches for irrigating purposes on the public domain.

Besides expressing the construction found in the instructions already set forth and presenting the opinions of the law officers as specified, the reply further states:

This has been the construction held since, and under it large portions of the public survey have been designated by the Director of the Geological Survey and set apart for reservoirs, ditches, etc., amounting to many thousand acres.

The reply concluded as follows:

"The Secretary is not called upon to express his views further than upon the construction he has placed upon this act; but he asks the privilege to say that he deems that this matter is one of such magnitude and of such vital interest to the people inhabiting or who may hereafter inhabit these vast regions, that if the Senate and House of Representatives do not as a body fully concur in the purpose of this law they should take the business in hand without delay, to so modify it as they may deem the public interests require, as otherwise there may be the greatest losses on the one hand to persons who, ignorant of the law or disregarding the same, settle upon these lands, or upon the other vast and valuable properties that should be controlled by the Government for reservoirs, ditches, etc.

"In this connection I beg leave to refer the Senate to the report recently made by the Committee on Arid Lands and Irrigation, and especially to so much thereof as is set forth in the minority report in relation to this subject, which has been submitted to the Director of the Geological Survey, and I believe meets with his approval."

But in reply dated July 30, 1890, to the resolution of the Senate dated July 10, 1890, in relation to the selection of sites for reservoirs (Fifty-first Congress, first session, Senate Ex. Doc., No. 199), the Secretary, in conclusion (page 2), stated that the general purpose and plan of the Department under the law (of October 2, 1888) was—

"To do no more than to recognize the effect of the statute that imperatively reserves reservoirs, ditches, and lands therein expressly named; and by appropriate executive action to let it operate distinctively upon the vast Territories to which it applies

by its own terms; preserving now as rapidly as possible the sources of water supply from the possession or appropriation by individuals or corporations that could thereby dominate all the people dependent for the fertility of their farms and the preservation of their homes upon the element of water. It is believed to be the duty of this Department so long as this statute remains to enforce it, that its fruits, at least in the preservation of the sources and reservoirs of water, may be kept under either National or State governmental control."

Congress did take the business in hand with great interest, and after much discussion the following provision was inserted in the appropriation act of August 30, 1890:

For topographic surveys in various portions of the United States, three hundred and twenty-five thousand dollars, one-half of which sum shall be expended west of the one hundredth meridian; and so much of the act of October second, eighteen hundred and eighty-eight, entitled "An act making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-nine, and for other purposes," as provides for the withdrawal of the public lands from entry, occupation, and settlement, is hereby repealed, and all entries made or claims initiated in good faith and valid but for said act shall be recognized and may be perfected in the same manner as if said law had not been enacted, *except that reservoir sites heretofore located or selected shall remain segregated and reserved from entry or settlement, as provided by said act, until otherwise provided by law, and reservoir sites hereafter located or selected on public lands shall in like manner be reserved from the date of the location or selection thereof.*

No person who shall, after the passage of this act, enter upon any of the public lands with a view to occupation, entry, or settlement under any of the land laws, shall be permitted to acquire title to more than three hundred and twenty acres in the aggregate under all of said laws; but this limitation shall not operate to curtail the right of any person who has heretofore made entry or settlement on the public lands, or whose occupation, entry, or settlement, is validated by this act: *Provided*, That in all patents for lands hereafter taken up under any of the land laws of the United States, or on entries or claims validated by this act, west of the one hundredth meridian, it shall be expressed that there is reserved from the lands in said patent described a right of way thereon for ditches or canals constructed by the authority of the United States.

The location and selection on the public lands of reservoir sites is proceeding with very decided energy under this law of August 30, 1890, and the present existence of the sites, their continued multiplication, and their future use now demand from the people and the Government the most serious consideration; for it must be determined what shall be done with them, and upon the proper answer to this question depends in great part the prosperity of the Territories or States in which they are located.

The act, it will be perceived, reserves from all lands west of the one hundredth meridian a right of way thereon for ditches or canals constructed by authority of the United States.

It needs but a moment's reflection to recognize that these reservoir sites must be upon very high ground for the most part to gain those natural depressions in the mountains or foot-hills where the water can be garnered in vast volume; that this water will be gathered in the season when the streams are full and overflowing, so that the amount caught in the reservoirs will not deprive any one of his own abundant

supply at that time, and were it not so reserved this overflow would go to waste; that both to conduct the water to the reservoir in the flood season, and thence back into the bed of the stream in the dry season, ditches must exist under the same control as that which commands the reservoirs.

In this connection it is also to be recognized that when these reservoirs exist they will be, with the water they contain, the absolute property of the United States on its own soil and not in any degree dependent upon the stream, which they are rather to supply than to exhaust.

Many of the streams also upon which these reservoirs will be, will run not only between States or between Territories or between Territories and States, but one or more also between Mexico and the United States; and thus the rapid expansion of the system of irrigation now already in progress and to be greatly increased both in extent and completeness, will be apt to exhaust the small supply of the summer stream and leave its bed quite dry before it reaches its ordinary mouth, and even at points near the reservoir, as well as at a distance, the tillers of these arid lands will be dependent for water upon these basins. Whatever authority, therefore, commands this water, the time of accumulation, of its supply and its use, will have control not only of the prosperity, peace, and even liberty of the people there, but possibly of the friendship of neighboring States and Territories, and also that between ourselves and the Republic south of us.

It will be an immense expense to make dams of such solidity and skillful construction as will assure safety to valleys and lands below, and appropriate ditches to and from the basins, or through lands, and Congress may not deem it best to build them, but may consider that the use of the lands segregated for reservoirs should be placed under local control for proper use in irrigation.

Therefore, in view of the facts and ideas already mentioned, the Secretary would urge that Congress should without delay enact comprehensive laws, determining the national policy in this business, and, if the reservoirs are subject to local control, particularly guarding against such misuse of the powers granted as would either allow the upper lands to absorb the water continuously through the dry season, or the authorities to require any but the cheapest and most liberal terms for its transportation to the inhabitants and farmers.

The act should sanction its provisions and reservations to these ends by the most severe penalties of forfeiture of the privileges conferred, and of all improvements, with absolute and immediate resumption by national control to preserve and effect its original purposes.

It is believed that if this is done there will never be any occasion for the exercise of the reserved powers, but that with less than this the national Government will abdicate its authority in a matter of vast importance to great areas of its lands and millions of its people, and find itself impotent to legitimately control affairs in emergencies that by foresight and wise legislation may now be prevented.

The Director of the Geological Survey has in his report dwelt upon the details of this subject, and here only its general outlines are brought before you. But with this presentation of the matter it is strongly recommended that attention be invited to the subject. It is a matter that should be taken out of the general appropriation bills and given its proper and separate place in legislation.

SWAMP LANDS.

The operations of the General Land Office as to swamp lands have embraced the claims under the State grants of September 28, 1850, and March 12, 1860, and the indemnity acts of March 2, 1855, and March 3, 1857. Under the former there were claimed and reported 19,216.53 acres, making, with all previous claims reported, 80,218,419.21 acres. Of this area there have been patented under the above-designated acts and that of March 2, 1849, 57,209,324.43. Under the indemnity acts of March 2, 1855, and March 3, 1857, there have been adjusted and allowed to this time 1,566,011.41 acres for cash entries of swamp lands, and 588,126.23 acres patented in lieu of swamp lands located with military bounty land-warrants and scrip.

During the past year cash indemnity accounts were allowed to the amount of \$32,472.83, and 7,906.63 acres patented to the several States.

The State of Florida has become quite urgent that more patents should be issued to it. In the last annual report mention was made of the claim of this State, which has been recently supported by a letter to the secretary by the governor and *ex officio* president of the board of trustees of the internal improvement fund of the State of Florida, replying to the last annual report of the Acting Commissioner of the General Land Office.

Of the 37,931,520 acres constituting the entire area of Florida, lists have been filed by the State for over 22,221,469 acres as swamp lands, the patents for 16,061,129.98 acres of which have already been issued. The law grants all legal subdivisions the greater part of which is "wet and unfit for cultivation." These lands are selected by State agents in the first place and lists filed, with report of the surveyor-general, in the General Land Office. Special agents then make actual examination of the lands themselves, and, upon favorable report, these are ordinarily patented. But Congress, by the act of March 3, 1857 (11 Stat., 251), confirmed lists to the States not then thus examined, and, among others, confirmed to Florida, of the above swamp lands, 11,630,271.51 acres. This act it is now claimed is an absolute grant of the lands listed at its date, whether in fact swamp or not, under decision of the United States Supreme Court in *Martin vs. Marks* (97 S. C. R., 345). The letter of the governor ends as follows:

In conclusion, Mr. Secretary, no matter what proportion of the lands heretofore patented to the State may be high and dry, or whether frauds have heretofore been perpetrated by Government or State agents, it can in no manner affect the right of

the State to the unpatented selections which come within the terms of the grant. Is it unreasonable that I should ask, now that nearly forty years have elapsed since the passage of the act, that with as little further delay as is consistent with due care, you make accurate lists and plats of such lands and transmit the same to the governor, and on his request to cause patents to issue to the State therefor.

To say nothing of lands of this class elsewhere, there are over 4,000,000 acres of unpatented selections within the Everglade region, which, to anyone familiar with the topography of Florida, are as certainly known to be "wet and unfit for cultivation" as that the east coast of the State is washed by the waves of the Atlantic.

This is a subject of grave importance, and will require further consideration.

In this connection it may be mentioned that, owing to the large beds of phosphate recently found in Florida, a great increase of entries has been made there. Since these phosphates fall under the head of minerals the lands are brought within the scope of the laws applicable to mineral lands, and to remedy some of the hardships growing out of the recent discoveries, Congress discussed the subject during its recent session, and passed the act entitled:

An act for the protection of actual settlers who have made homesteads or pre-emption entries upon the public lands of the United States in the State of Florida upon which deposits of phosphate have been discovered since such entries were made.

The Commissioner's suggestion therefore that some law should be passed for the relief of settlers upon whose claims valuable deposits of mineral may be found after settlement, has been anticipated in large part. But this act relates merely to Florida, and it will be perceived that the suggestion is for a similar law of general application. In the Secretary's judgment, however, the general statutes should be allowed to stand as they are, and if cases arise where they must be changed it will be time enough to act as each case may require attention.

TIMBER TRESPASS.

In the protection of the public timber lands during the year fifty-five agents were employed.

There were reported three hundred and ten cases of trespass, involving \$3,067,151.66. The sums recovered during the fiscal year by the Government from such suits amounted to \$100,910.32.

There were pending on July 1, 1890, as far as reported, two hundred and eighty-two civil suits for the recovery of \$14,794,286.55 for timber reported as having been unlawfully cut from the public lands, and three hundred and six criminal prosecutions for violations of timber laws.

It will be perceived from this exhibit that the special agents performed a great amount of hard work with very immediate profit to the Government. But it must not be forgotten that far greater benefits are realized from the knowledge on the part of those evilly-disposed that they can not commit fraud and robbery on the public domain with impunity. Were this force withdrawn, there can be no doubt that depredations would greatly increase, and for the most part escape punishment or detection.

FORESTS.

The Commissioner states that from an examination of the annual reports of his Office for the past eight years he finds that the most valuable timber on the public lands is being rapidly exhausted, and that the several laws now in force are wholly inadequate to prevent the public forests from illegal appropriation, or to protect the interests of the settlers who may need to use them in the development of the country.

Perhaps the most flagrant instances of lawless invasion of the public domain have been found in the neighborhood of the Rainy River, forming part of our northern boundary line. The people of Canada have made great roads into our forests, and the timber is taken out on the river, where many steamers are engaged in this illicit business. There has been sent to those regions an expedition, fitted for a winter campaign, to detect and arrest these depredators. The force is from the Bureau of the General Land Office, and its report will be placed before Congress. It is anticipated that this commerce, so profitable to others at our expense, will be soon brought to an end.

Attention is called to the several acts of Congress granting the use of public timber to aid in the construction of railroads, and also the act of June 3, 1878, authorizing certain persons "to fell and remove timber on the public domain for mining and domestic purposes," which, in the opinion of the Commissioner, have "opened a door to unlicensed waste and destruction."

The Commissioner recommends the enactment of a law repealing statutes that prohibit the entry of rugged, stony, or other timber lands unfit for cultivation, except under the mining or town-site laws, and allowing the settlers to use the timber on such lands which they may actually need in developing the country; and that the several States and Territories be invited to enact concurrent legislation prohibiting the destruction of the timber on the public lands, and prevent it from being removed or passed into the hands of a monopoly for only speculative purposes.

The Commissioner also submits his report on Senate bill No. 1394, dated March 10, 1890, giving in detail his views upon the timber question. In this he refers to the encouragement given by law to citizens to settle upon the public domain, and also to the prohibition contained in section 2461 of the Revised Statutes against the use of timber from the public lands by such settlers in the development of the country.

The protection of the timber upon the public domain is of the first importance. The great commercial value of this product, the ease with which it may be illegally appropriated, the difficulty of protecting the large forests from ravages by fire, which destroys annually a very much larger amount of wood on the public lands than all other causes combined, seem to require additional legislation by Congress.

In the Secretary's last annual report (pages 36, 37) it was earnestly

recommended "that Congress appoint a commission to take into consideration the subject of the public timber lands, with a view of ascertaining the best method for their treatment, management, preservation, or of their disposal." The reasons are still in full force why such a commission should be provided for by Congress, and the recommendation is therefore renewed and emphasized.

DECISIONS ON IMPORTANT CASES OF CONTEST.

Since the last annual report a number of important questions involving the disposition of public lands have come before the Department for final determination, and it seems proper to submit herewith memoranda of a few of these cases, as indicative of their character and importance and the Departmental conclusions reached therein.

FRANK BURNS, (10 L. D., 365).

The control of unsurveyed lands, within the territories, lying below high-water mark, and above low-water mark ("tide lands") was involved in the case arising on the application of Frank Burns to locate Valentine scrip on lands of this character at Seattle, Wash. The application was made prior to the admission of the Territory into the Union; but while such application was pending on appeal, the enabling act was passed, and the State was duly admitted. The Department denied the application of Burns, holding that the lands in question were not "public lands," and hence not subject to appropriation by Valentine scrip, and that on the admission of a State into the Union it acquires by virtue of its inherent sovereignty absolute title to all tidelands on its borders to the exclusion of any pending unadjusted scrip locations for such lands.

GAMBLE V. SAULT STE. MARIE, (10 L. D., 375).

An important case, involving the authority of the Government to dedicate public land to municipal uses, and the effect of such dedication, came up on an application to locate Porterfield scrip on a small tract of land in the village of Sault Ste. Marie. This village grew up about the old military post known as "Fort Brady," and, prior to September 26, 1850, had attained a considerable size. As it occupied public land, Congress, as of the date above, authorized proceedings to ascertain the rights of individual lot claimants, the position and extent of land required for military purposes, and directed the survey of the village into town lots, streets, and public squares, and the preparation of a plat showing the squares, individual lots, and public lots, and lots reserved for military and other public purposes. This plat as approved showed a tract of about three acres reserved as a village cemetery.

The village was incorporated in 1874, and subsequently, for sanitary reasons, the use of the land for cemetery purposes was discontinued, and thereafter an application to locate said scrip on such land was

made. This application was denied by the Department on the ground that the proceedings under said act of Congress, and in conformity therewith, constituted a statutory dedication to the village of Sault Ste. Marie of the land set apart for cemetery purposes, whereby the title passed from the United States, and upon the incorporation of the village, vested in the municipal authorities thereof, and that said land was not thereafter subject to appropriation as "public" land of the United States. (*Gamble v. Sault Ste. Marie*, 10 L. D., 375.)

INSTRUCTIONS TO THE GENERAL LAND OFFICE.

In the administration of the timber-culture law a question of serious importance arose, involving former Departmental regulations with respect to the period of cultivation required of the claimant. It was held by the Department for many years that the time allowed by the statute for the preparation of the land and the planting of the trees might be computed as a part of the requisite eight years of cultivation. Under this construction of the law final proofs were submitted on some twenty-five hundred entries. But on June 27, 1887, the Department issued a circular regulation to the effect that the period of cultivation must be computed from the time the full acreage of trees, seeds, or cuttings was planted. Under the later regulations these final proofs were insufficient to warrant the issuance of patents. But recognizing the right of parties to protection who had acted under the Departmental construction of a statute, and following the rule that such a construction, while unrevoled, has all the force and effect of law, it was held (9 L. D., 86) that the proofs thus submitted should be accepted if otherwise satisfactory, though adhering to the later construction of the law in case of entries made subsequently thereto.

CHILDS v. SOUTHERN PACIFIC RAILROAD COMPANY.

The status of lands embraced within the limits of railroad grants, and alleged to be excepted from the operation of the grant by reason of being within the claimed boundaries of a private claim at the date when the grant took effect, has been many times before the Department for consideration, and the rulings thereon have in substance sustained the exception. But in the case of *Samuel R. Childs v. The Southern Pacific Railroad Company* (9 L. D., 471), the private claim was one of quantity within larger outboundaries, and it was held, following the recent decisions of the United States Supreme Court in the cases of the *United States v. M. Laughlin* (127 U. S., 428) and *Doolan v. Carr* (125 U. S., 618), that only so much of the larger tract was reserved for the adjustment of the claim as was required for the satisfaction thereof, and that lands thus within the larger outboundaries of an unlocated private claim of this character are subject to the operation of a railroad grant at the date when it becomes effective, except as to the quantity actually required to satisfy the claim.

NORTHERN PACIFIC RAILROAD COMPANY *v.* STOVENOUR.

The status of lands within the limits of a railroad grant at the date when it becomes effective was also considered in the case of the Northern Pacific Railroad Company *v.* Stovenour (10 L. D., 645), and it was held in that case, following previous rulings, that a prima facie valid pre-emption filing of record, at the date when the grant becomes effective, excepts the land covered thereby from the operation of the grant, on the ground that such a filing raises a presumption of settlement as alleged, and of the actual existence of the pre-emption claim, that is conclusive as against a grant which excepts from its operation lands covered by "pre-emption claims." It was, however, held in the same case that where the statutory period for making final proof and payment under such filing has expired, without such proof and payment having been made, no such presumption as to the validity of the claim as against the grant exists, but that it must then be presumed that the claim under such filing has been abandoned, though proof to the contrary may be submitted by any one asserting a right to the land.

CENTRAL PACIFIC RAILROAD COMPANY *v.* VALENTINE.

The grant of lands to aid in the construction of the Central Pacific Railroad, by the acts of Congress approved July 1, 1862 (12 Stat., 489), and July 2, 1864 (13 Stat., 356), provides that "all mineral lands" shall be excepted from the operation of the grant. In the case before the Department of said company against Valentine (11 L. D., 238) it was urged that the rights of the company attached at the date when the line of its road was definitely fixed, and that lands that were not then known to be mineral lands would pass under the grant, but it was held by the Department that the discovery of the mineral character of land at any time prior to the issuance of patent therefor effectually excludes such land from a railroad grant which contains a provision excepting all mineral lands therefrom (10 L. D., 365).

TOWN-SITE OF KINGFISHER *v.* WOOD ET AL.

The opening of Oklahoma to settlement and entry has brought before the Department a number of interesting and serious questions for determination, and among the most important is that presented by the case of the Town-site of Kingfisher *v.* Wood *et al.* (11 L. D., 330). The provisions of the act (March 2, 1889) opening these lands to settlement and entry prohibited in express terms any one from entering said Territory prior to the hour fixed by the President's proclamation with the intention of settlement on any part thereof, and provided that a violation of this restriction should forfeit the right to acquire title to any of said lands.

In the case referred to it was held, as against one of the parties alleging a settlement right, that no permission or license to be within said

Territory, by virtue of special employment therein, could be granted as against the express terms of the statute, or used to defeat the equal operation thereof and the rights of others thereunder; and that one who thus is permissibly within said territory prior to the opening thereof, and seeks to take advantage of his presence therein, "enters and occupies" the same in violation of the statute, and is accordingly disqualified to enter any of said lands or acquire any right thereto.

From these examples of the many important cases coming before the Secretary for adjudication it will be perceived that his daily duties as a judge are among the most difficult and laborious he has to perform. It is true he has the valuable aid of the assistant attorney-general assigned to the Department and of the first assistant secretary on these appeals, each of whom now in office have brought to the task eminent ability and the greatest industry; but, nevertheless, the case must always be studied, the opinion approved in substance and expression, and the judgment corrected or altered if found necessary, and, not infrequently, the whole labor of hearing, digesting, deciding, and writing falls upon the Secretary alone.

ABANDONED MILITARY RESERVATIONS.

Particular attention is called to the following extract from the Commissioner's report, and the appropriation requested is strongly recommended:

The appropriation of \$20,000 for the survey, appraisal, and sale of abandoned military reservations by the act of March 3, 1885, was exhausted in the execution of the surveys under the instructions of departmental letter of January 20, 1887.

No further instructions authorizing surveys of these reservations have been received since that date. Lack of funds has prevented a further compliance with the provisions of the act of July 5, 1884, authorizing the survey, appraisal, and sale of these reservations, and it is urged that an appropriation of \$20,000 will be necessary to complete their survey.

An official list of these reservations, seventy-five in number, and their acreage and present condition, will be found in Appendix C to the report.

LAND CONTESTS.

The following table, taken from the Report of the Commissioner of the General Land Office, shows the present condition of the contests now pending in his Bureau:

	Cases.
Contests on hand July 1, 1889	8,186
Received during the year	7,611
Total	15,816
Cases finally disposed of	8,470
Leaving pending July 1, 1890	7,346

Involved in these pending 7,346 cases is embraced an acreage of 1,175,360 acres.

Of cases where no appeal was taken from the local land officers,

counting those on hand July 1, 1889, and those received after, there were 11,560, of which 7,374 were disposed of during the year.

All the special force now authorized is still required to detect and defeat, and in many instances to punish the mistakes and frauds injurious to the just administration of the national land system. During the past year there have been six special agents in the field making personal examination of land claimed under the swamp land grant and attending to taking of testimony offered by the several states, showing the character of the lands claimed. There have been also sixty-one agents employed in investigating fraudulent land entries and protecting the public lands from illegal appropriation during the year. From them have been received during this time, 2,027 reports, which, with 273 pending July 30, 1889, made for the year 2,300; 1,785 of them have been acted on, leaving 515 pending June 30, 1890.

The Commissioner's report exhibits in detail the results of the work depending upon the sufficiency and intelligence of the special agents appointed for the investigation of fraudulent land claims and also of those for public timber depredations. (Pages 79, 80.)

OKLAHOMA CONTESTS.

Oklahoma was created a Territory by act of Congress approved May 2, 1890, and there was approved, on the 14th of the same month, the act entitled "An act to provide for town-site entries of lands in what is known as 'Oklahoma,' and for other purposes." As required by this last-named act, the Secretary created boards of trustees and made regulations for their control. These are hereto annexed (Appendix B). The boards have proceeded with their duties at the following-named town sites: Guthrie, Oklahoma, Kingfisher, Norman. The situation has been most anomalous, and the utmost patience and care have been required to meet justly the multiplied and often conflicting interests involved. The expense of the several boards has been necessarily large, but no more so than the circumstances demanded. The most severe feature of the case is that which requires that all appropriations expended shall be collected off the contestants and refunded to the Treasury from assessments made, the rule having been adopted requiring a deposit each day, sufficient to meet expenses, from the several contestants the deposit of the successful party being returned to him. The property of the whole town site according to its value was assessed for those expenses that were general and outside those that would be particularly caused by the contests over particular lots. An important opinion was rendered in the case hereinbefore set forth in brief (*Townsite of Kingfisher vs. Wood*), which construed the rights of those who were in the Territory before noon of April 22, 1889, if they had the purpose at that time of settling upon lands there.

The work has not yet been completed, and there have been no recent

complaints. There are some town sites that may not be able to bear the attendant expense, and there may be need of further legislation for their relief.

SALARIES OF ASSISTANT SECRETARIES.

It is a part of the work of both the First Assistant Secretary and the Assistant Secretary to pass upon many cases of importance that do not reach the Secretary, and the First Assistant has also, with the Assistant Attorney-General, to hear and prepare opinions to be recommended and signed by the Secretary. The Assistant Secretary presides over the Board of Pension Appeals, and all pension departmental opinions are made by him under the Secretary. These officers do great labor and of the most important kind, and it is strongly recommended that their salaries be increased to \$5,000 each.

RECEIVERS OF PUBLIC MONEYS.

Soon after the present administration was inaugurated it was discovered that many of the local land offices throughout the country were not complying strictly with the law in making deposits of the public moneys they received from day to day and week to week, where the offices were distant from a proper place of deposit, and a number of them were reported as defaulters. Some of them were actually so, but on further examination it was found that the charge was not sustained as against a few who, although they had not strictly complied with the law, had done so substantially; and the cause of their being apparently derelict arose from the fact that notices of their deposits were sent only to the Treasury Department, and the information did not reach the Land Office before the account was there made up.

This has been corrected by the Secretary of the Treasury requiring receivers of the public moneys to send when required duplicate receipts for any deposits made by them at the depositories to the General Land Office, as well as to the Treasury Department. By this means the credit appears at once in the Land Office as well as in the Treasury, and the account as made up in either place will be the same. This very slight change, it is thought, will prevent the loss of vast sums of money to the Government. The loss through receivers, appointed by the previous administration, amounted to over \$25,641.17. Prosecutions have been instituted, and it is hoped that the greater part will be recovered.

A GREATER FORCE AND MORE ROOM NEEDED FOR THE WORK OF THE GENERAL LAND OFFICE.

Notwithstanding all the labor that has been done, as shown in the previous statements, the work of the General Land Office is yet largely in arrears. The result of this in loss and inconvenience to the people is very great. The settlers are among our very best people, intelligent

and industrious, seeking to make homes for their families where they may enjoy a competency and independence. The whole public land system has for its aim to bestow the lands upon them under the most favorable conditions, so that they may be encouraged to develop the resources of our country, but this benign purpose is in a very great degree defeated by the want of sufficient appropriations for the employment of clerks in the Land Office, and by not giving that office such space to work in that it may be done correctly and expeditiously.

The settler commits himself in trusting confidence to the promises of the Government; but years after he is entitled to his patent, he finds himself without this evidence of his right. Unacquainted with the vast demands similar to his own pressing for attention, he blames the General Land Office for what is to him an inexplicable delinquency. This delay and the criticism it engenders is unjust and needless. With the vast resources at its command, and the money receipts obtained from the public lands themselves, it is unreasonable for the national legislature to withhold the means of giving the owner, within a reasonable time, the evidence of his right to the land.

These remarks apply with equal force to that portion of the work that must be spent upon contested claims. In every contest, he who has the actual right to the land is doubly interested in securing a patent at as early a day as possible. First, as one desiring to have the evidence of title to his land; and again, and more particularly, because it has been brought into question. So long as it is questioned, and judgment deferred, the occupant is deterred from making improvements, is deprived of credit, and suffers greatly in anxiety as to the result.

It is conspicuous in every bureau of this Department that the work essential to an efficient public service is increasing with the population and the spread of settlement to a degree that does not seem to be comprehended by the law-makers. The effort to fit upon the present state of affairs the measures that were suitable to the last decade is made in vain. Neither the buildings nor the force that occupies them are commensurate with the public demands. No true statesman will attempt to save a small portion of the public revenue either by exacting immoderate toil from its employes, or by delaying the people in the enjoyment of their fairly-earned titles to land and defeating their just expectations.

INDIAN AFFAIRS.

In reviewing the past year's work of the Department in regard to Indians, it is seen that there has been steady progress made in engaging them in peaceful ways and industrial pursuits. A stronger desire is manifested among many for the education of their children, for the individual ownership of land, and generally for the comforts of civilization.

But it needs to be said that a much larger area of land than is nec-

essary is held for Indian occupancy. There are not more than 250,000 Indians within the borders of the United States (excluding Alaska). The greater part of these reside upon or have some interest in the existing reservations, the others living upon a portion of the public domain. The aggregate area of the Indian reservations was, at the last report, about 116,000,000 acres, or 181,250 square miles, which is, as calculated by the Indian Commissioner, "greater than that of the New England and Middle States combined, greater than the aggregate area of the States of Ohio, Indiana, Illinois, and Kentucky, and nearly equal to the combined area of the two Dakotas and Montana; or, to carry the comparison further, it is larger by half than the United Kingdom of Great Britain and Ireland, larger than Sweden or Norway, and nearly as large as either France or Spain."

There has been a reduction during the fiscal year by cession of Indian title to reservations under ratified agreements to the extent of about 13,000,000 acres of lands heretofore held by them, leaving the aggregate area of reserved land at this time over 103,000,000 acres. This is sufficient to give each of the occupying Indians, or those having rights thereon, over 750 acres. If all were given allotments as provided in existing laws and treaties, each Indian would receive not more than an average of 80 acres of agricultural land, or 160 acres of grazing land. The surplus held in reservation appears therefore to be unreasonably large. A large portion of it is lying idle, and is a bar to the Indians' progress, and our country's development. To restore this to the public domain will work no hardship to the Indians, if the cessions are made upon terms as fair as have characterized the agreements recently negotiated. Those Indians especially who are supported by the Government, not because of treaty obligations, but in order to save them from starvation, should not continue to hold these large tracts without actual occupancy or use. It would be better for each tribe to part with its claim for a money consideration that would create a fund to be securely held by the United States, and upon which it could depend for the support of its members until, by proper use of individual homesteads, they may support themselves.

INDIAN CESSIONS.

The cessions made by various tribes should be more particularly set forth, as there were serious obligations imposed on the United States thereby that have not yet been performed.

THE GREAT SIOUX IN NORTH AND SOUTH DAKOTA.

Under the provisions of acts of Congress approved March 2, 1889 (25 Stats., 888), and also a clause in the Indian appropriation act, approved the same day (25 Stats., 1002), a commission was appointed by the President on April 19, 1889, and negotiations with the Indians were

egun in the early part of June. In the Secretary's last annual report the authority and organization of this commission were set forth at length, but it had not then made its report. This was done under date of December 24, 1889, and with it was presented satisfactory proof of acceptance and consent of the act by more than three-fourths of the whole number of male adults occupying or interested in the Great Sioux Reservation. A number of recommendations, promised to the Indians by the commissioners, pertaining to matters not embraced in the act, were embodied in the report.

The President, by proclamation dated February 10, 1890, made known the acceptance of said act, and declared it to be in full force and effect, and on the same day there were transmitted to the Senate and House of Representatives the report of the commission and accompanying documents, together with a communication from this Department, dated January 30, 1890, submitting a draught of a bill embodying the several recommendations of the commission, and the necessary provisions of legislation to carry them into effect. (See Senate Ex. Doc. No. 51, Fifty-first Congress, first session.)

The appropriations made or found available have been such as to enable the Department to perform only partially the requirements of the act. No funds were appropriated and no legislation enacted to fulfill the recommendations made by the commission to the Indians, in the following particulars:

(1) For payment to the Indians of the Standing Rock and Cheyenne River agencies for value of ponies taken from them in 1876, for which \$20,000 was estimated.

(2) For compensating the Indians of the Crow Creek Reservation for losses sustained by them in receiving in their diminished reservation less land per capita than was secured by other Indians. For this purpose \$187,039 was estimated.

(3) For purchase of land for those Santee Sioux Indians in Nebraska who had received no lands in severalty on their reservation by reason of restoration of all the unallotted lands to the public domain. For this the estimate made was \$32,000.

(4) For a division and apportionment of the permanent fund provided for under section 17 of the Sioux act of March 2, 1889, so as to have a separate fund for each of the diminished reservations placed to the credit of the Indians occupying them. The Commission promised the Indians when obtaining their consent that these things should be accomplished. Recommendations to this effect have been made, and still, in *good faith*, demand recognition.

The attention of Congress should also be again called to the fact that no provision was made in this act or otherwise for the expenses of the surveys rendered necessary to carry out its provisions, nor for the expenses of making allotments to the Indians. Items of appropriation were submitted by this Department, but were not provided for by

Congress. (See House Ex. Doc. 284, Fifty-first Congress, First Session.) There were 9,000,000 acres ceded to the United States under this agreement.

THE CHIPPEWAS IN MINNESOTA.

In the last annual report attention was invited to the work of the commission appointed to conduct negotiations with the Chippewa Indians in Minnesota, as provided in the act of Congress approved January 14, 1889, (25 Stats., 642). A final report, dated December 26, 1890, was submitted by the commission with an agreement (in ten parts) executed by the various bands or tribes of said Indians, accepting all of the provisions of the act. There were also submitted the proceedings of the several councils held and a census of the Indians, taken as required by the act, the number of male adults of each of the separate bands being given and the number of such persons assenting to the act, a summary of which shows that 1,884 signed the acceptance of the act, being over 86 per cent.; more than the requisite two-thirds specified on each of the several reservations, and more than two-thirds of such adults of all the Chippewa Indians in Minnesota, as required in the case of the Red Lake Reservation. (See Section 1.)

On March 4, 1890, the President gave his requisite approval to the agreement and transmitted to Congress a copy of the report of the commission and all necessary papers, together with a draught of a bill providing for the means to carry out the provisions of the act. The documents can be found in House Ex. Doc. 247, Fifty-first Congress, first session.

The commissioners having reported that the Indians generally had indicated to them their desire and intention to take their individual allotments on the reservations where they were residing when the negotiations were conducted, and it being manifestly impossible to ascertain and determine as to what particular portions and how much of the land within the several reservations (except Red Lake and White Earth Reservations) would be subject to appraisal and sale under sections 4 and 5, or to settlement and sale under section 6 of the act, until the Indians had had an opportunity to select their allotments, public notice was given by the Secretary, March 5, 1890, to the effect that none of said land, whether "pine lands" or "agricultural lands" within said reservations, were open or would be open to sale or to settlement by citizens of the United States, until advertisement to that effect should be given, and then only as provided in such act. All persons were therein warned to refrain from going upon any of the lands within the limits of said reservations for any purpose or with any intent whatsoever; that no settlement or other right could until then be secured upon said lands, and that all persons found unlawfully thereon would be dealt with as trespassers and intruders.

The balance of the appropriation of \$150,000, made by section 8 of the act, after deducting \$90,000 for payment of interest, as required

thereby and about \$30,000 for the expenses of the commission, was so small as to render it impossible to do much toward carrying out the further provisions of the act, until additional appropriations were made by Congress.

However, orders were given for the survey and marking of the out-boundaries of the Red Lake diminished reservation, and for the subdivision of the same, and also for the extension of the public surveys over portions of the ceded lands, beginning with the land south and east of the diminished reservation.

The task has proven a delicate one, from the legal questions involved on the one hand and the possible conflicts that may arise on the other. But under the negotiations now in progress it is believed the business will soon be brought to a conclusion satisfactory to all concerned.

Congress at its last session appropriated the sum of \$200,000 for carrying out the further provisions of the act, one-half of which is to be applied to the surveys, appraisals, removals, and allotments.

The chairman of the commission, Mr. Rice, is now in the field actively engaged in instructing and assisting the Indians under the new order of things, and it is the Secretary's purpose to prosecute the work of removal, allotting lands, and surveying the ceded lands not required for allotments and disposing of them as rapidly as the circumstances will warrant and the means provided admit.

OTHER CESSIONS MADE.

There are pending in Congress agreements as follows: For the cession of about 1,600,000 acres of the Fort Berthold Agency Reservation in North Dakota, negotiated under provisions of the act of May 15, 1886 (24 Stats., 44); for about 184,960 acres of the Coeur d'Alene Reservation in Idaho, negotiated under the act of March 2, 1889 (25 Stats., 1003); for about 600,000 acres of the Lake Traverse Reservation in South Dakota, negotiated under the provisions of section 5 of the general allotment act of February 8, 1887 (24 Stats., 383); for about 1,095,000 acres of the Southern Ute Reservation in Colorado, negotiated under the fourth section of the act of May 1, 1888 (25 Stats., 133), and for about 7,871 acres of the Flathead Indians in Bitter Root Valley, Montana, negotiated under the provisions of the act of March 2, 1889 (25 Stats., 871). These should all have early attention by Congress.

CESSIONS BY VARIOUS TRIBES THROUGH THE CHEROKEE COMMISSION.

Early in April of this year the commission appointed under the provisions of section 14 of the Indian appropriation act, approved March 2, 1889 (25 Stats., 1005), was returned to the field (under the chairmanship of Hon. David H. Jerome, of Michigan), and proceeded to the Indian Territory.

The commission undertook negotiations with tribes occupying lands

west of the 96° of longitude within the Territory of Oklahoma as constituted by the act of May 3, 1890, and met with almost immediate success.

Agreements have been concluded with the following Indians, subject to ratifications by Congress, whereby they will take allotments in severalty and relinquish their surplus lands to the United States, viz:

The Sacs and Foxes of the Mississippi.—This reservation contains 479,668 acres. It is estimated that 155,000 acres will be required for allotments, leaving a surplus of some 325,000 acres, for which the sum of \$485,000, or about \$1.49 per acre, is to be paid.

The Iowas.—This reservation contains 228,418 acres. 12,418 acres will be required for allotments, leaving a surplus of some 216,000 acres, for which the sum of \$84,350, or about 39 cents per acre, is to be paid.

The Absentee Shawnees and Citizen Pottawatomies.—This tract of land contains 575,877 acres, of which 175,877 acres will be required for allotments, leaving a surplus of some 400,000 acres, for which the sum of \$225,000, or 56½ cents per acre, is to be paid.

These agreements were submitted by the President to Congress where they are now pending. (See Senate Ex. Docs. Nos. 171, 172, and 186, Fifty-first Congress, first session.) When ratified, they will result in opening to homestead settlement some 941,000 acres of land, the aggregate amount to be paid therefor being \$794,350, an average price of 84.4 cents per acre.

By a clause in the act of August 19, 1890 (Public No. 235, p. 23), the sum of \$20,000 is appropriated to enable the Secretary of the Interior to continue the commission, and it is now in the Territory of Oklahoma, engaged in negotiations with the Cheyennes and Arapahoes, which, at the latest account, promise to be successful.

OTHER COMMISSIONS TO NEGOTIATE CESSIONS.

The appointment of the following commissions was also authorized during the last session of Congress:

NORTHERN BAND OF CHEYENNES.

(1) To negotiate with the northern band of Cheyenne Indians on Tongue River Reservation and its vicinity in Montana, and with the band of Northern Cheyenne Indians on the Pine Ridge Reservation in South Dakota, for such modification of their treaty and other rights as may be deemed desirable by these Indians and the President, and for their removal and permanent settlement upon any existing reservation; and if necessary to negotiate with any other tribe or band of Indians for such portion of their reservation as may be required for the permanent settlement of the Northern Cheyennes.

PUYALLUP INDIANS.

(2) To visit the Puyallup Reservation in Washington, and to make full inquiry and investigation as to the nature of the title to, and

value of, the lands allotted in severalty; whether there are any common lands, and if so the value of the same, and the interest of the Indians therein; whether any restrictions now existing upon the power of alienation by the Indians of their patented lands should be removed in whole or in part; as to the manner in which lands shall be disposed of when the Indians shall be invested with power to dispose of their individual tracts; and as to other various matters regarding the status of the lands, rights of way for railroads, welfare of the Indians, etc.

TURTLE MOUNTAIN BAND.

(3) To negotiate with the Turtle Mountain band of Chippewa Indians, in North Dakota, for the cession and relinquishment to the United States of whatever right or interest they may have in or to any and all land in said State to which they claim title, and for their removal to the White Earth Reservation in Minnesota; also to obtain the consent of the Chippewa Indians in Minnesota for the settlement of said Turtle Mountain Chippewas on the reservation lands of the former.

WARM SPRINGS INDIANS.

(4) To visit and thoroughly investigate and determine as to the correct location of the northern line of Warm Springs Indian Reservation in Oregon, and to negotiate with the Indians located on the Colville Reservation in Washington for the cession of such portion of the reservation as the Indians are willing to dispose of, that the same may be opened to settlement.

Each of the foregoing commissions provided for in the Indian appropriation act approved August 19, 1890, has been appointed by the President, has been instructed as to its duties, and is now engaged in the work of which the respective laws approved.

ROUND VALLEY INDIANS.

(6) The act of October 1, 1890, entitled "An act to provide for the reduction of the Round Valley Indian Reservation, in the State of California, and for other purposes," provides for a commission of three disinterested persons, to be selected by the President, to select grazing and timber lands within the Round Valley Reservation in California to be retained by the Indians, and to appraise the value of any and all agricultural lands within said reservation, with the improvements thereon, which have become the property of individuals by purchase from the State of California, and also to appraise the value of all improvements made by private persons or firms before the 3d day of March, 1873, upon any of the other lands of the reservation included within the lands selected and retained for the Indians. The act also provides for a similar commission to be appointed by the President to appraise the remainder of the grazing and timber lands of the reservation and the improvements placed thereon before the 3d of March, 1873.

CROW INDIANS.

The act of September 25, 1890, entitled "An act to authorize the Secretary of the Interior to procure and submit to Congress a proposal for the sale to the United States of the western part of the Crow Indian Reservation in Montana," provides for a commission of three persons, to be appointed by the Secretary of the Interior, to negotiate with the Crow Indians for a surrender to the United States of all that portion of their reservation in Montana, or so much thereof as they will consent to surrender, which is situated south of the Yellowstone River and west of the divide between Pryor Creek and Clark's Fork, in said State.

None of the agreements that may be made by these commissions are to be valid until ratified by Congress.

PRAIRIE BAND OF POTTAWATOMIES AND KICKAPOOS.

The commission appointed under the act of March 2, 1889, to treat with the Prairie band of Pottawatomies and the Kickapoo Indians in Kansas, is continued by a clause in the Indian appropriation act, and will proceed again with its efforts to complete the agreement it failed to secure during the past year.

CENSUS OF SIOUX NATION OF INDIANS.

By the Indian appropriation act of March 21, 1889 (25 Stats., 992), provision is made requiring—

That the Secretary of the Interior shall cause a census of the Sioux tribe of Indians to be carefully taken by a special agent to be appointed for such purposes, with a view of ascertaining how many of them are able to support themselves, and, in ascertaining this fact, their physical capacity to work, the land owned or occupied by them, either individually or collectively; the value of the land, its nearness to market, and general productiveness shall be considered, and such other facts and circumstances as will aid Congress in determining how many of such Indians are capable of support.

For this duty a special agent was appointed under date of June 24, 1889. He has not as yet finished his work, nor filed any statistical or complete reports of it; but from his bulletins of progress made each week sufficient data has been obtained to show that the number of Indians of Rosebud Agency was greatly overestimated and that issues of rations were being made to the chiefs and head men for over two thousand more Indians than were actually present on the Rosebud Agency Reservation. Immediately upon receipt of this information, action was taken by the Indian Office to reduce the quantities of food for the delivery of which contract arrangements for the fiscal year had been made.

Knowledge of the extent of the ability of these Indians to support themselves, when procured in accordance with the provisions of the act, will be of great value in assisting the Department to carry out the provisions of article 5 of the agreement approved February 28, 1877.

19 Stats., 256, which among other things provides that "such rations, or so much thereof as may be necessary shall be continued until the Indians are able to support themselves." This provision of the agreement while imposing upon the Government the obligation to sustain the Indians until they are able to support themselves, imposes upon them no less the obligation and duty to address themselves to the task of becoming self-supporting.

If the terms of the recent agreement made with them are speedily provided for and enforced it is believed that this tribe will presently be distinguished for its rapid progress toward civilization as it has heretofore been for bravery and intelligence in savage warfare. Fair and generous treatment by the Government is the best means to bring about this desirable condition.

APACHE INDIANS IN ARIZONA.

A portion of the Indians belonging on the San Carlos Reservation, in Arizona, continue to give some apprehension of outbreak among them. The overt acts of violence and the disturbances created are caused mainly by a few renegade Indians. In order to maintain greater security of life and the preservation of peace in the Territory it was determined by the military authorities commanding them to be necessary to remove the turbulently disposed Indians to some place where they could be more securely restrained. The military post of Fort Union, in New Mexico, was selected as the best place for that purpose, and to it sixty-eight of the dangerous class of the Apaches of San Carlos were removed in March, 1890, where they are now detained under military control. The rations furnished them by the War Department should have been paid for out of the appropriations made to the Department of the Interior, "to subsist and properly care for the Apache and other Indians in New Mexico or Arizona," but the accounting officers of the Treasury Department have refused to allow this money to be so applied. It is hoped, however, that some adjustment of this fair demand may yet be made; for otherwise these now held for the sake of peace will have to be restored to the camps and new disorders will be apt to arise.

At the same time Major-General Nelson Miles, then commanding the Division of the Pacific, urged again upon this Department, through the War Department, his views for removing from the San Carlos Reservation the more peaceably disposed Tontos and Mojaves to the Camp Verde and Fort McDowell military reservations, in order to separate them from those who were disposed to be troublesome at San Carlos, and because the Indians desired to go to those localities, from which they had been formerly removed. This proposition had been fully discussed and considered by Mr. Secretary Lamar and Mr. Secretary Vilas, both of whom declined to favor it. Notwithstanding this, the importance of the subject caused it to be taken under consideration by the present Secretary, and a report thereon was received from Capt. J. L. Bullis, of

the United States Army, the acting agent at San Carlos, which is substantially as follows:

(1) That the Indians on San Carlos Reservation do not at present manifest any turbulence. There are eight renegades and murderers at large; five from San Carlos who were in the hands of the civil authorities, but escaped.

(2) In 1875, the Mojaves, Yumas, and Tonto-Apaches were removed from the Verde Valley to this reservation. Most of the Yumas and Mojaves, who number in all about eight hundred, and some of the Tontos, who number in all about six hundred, are desirous of returning. They might be divided between Fort Verde and Fort McDowell, both located in Verde Valley about 90 miles apart.

(3) Should the fourteen hundred Yumas, Mojaves, and Tontos be removed, a reduction of two-fifths of the annuity goods, supplies, etc., for San Carlos might be made, but all the employes would still be necessary.

(4) The said Indians could not be cared for at Forts McDowell and Verde without the establishment of an agency at each point. They would have much less country than they have now, would be much more closely surrounded by whites, and would therefore be more liable to get into trouble.

The area of the Fort Verde Reservation is 9,000 acres; that of Fort McDowell, 27,750 acres. The greater part of the latter is reported to be rough and broken. Only a small portion of the two reservations is suitable for agricultural purposes.

From a military point of view, great weight is attached to General Miles's views in regard to what is best to be done to accomplish the military duty required in that locality; but to carry out his suggestions, it appears that there would be required the establishment and maintenance of two additional agencies for the management of Indians in Arizona, and appropriations for these would have to be secured from Congress. Protests, moreover, have already been received from the governor of Arizona, and from other sources, against the removal of Indians from the San Carlos Reservation to the Verde Valley.

Under all the circumstances, and in view of the information furnished by the acting agent at San Carlos, an officer of the Army, it is not deemed that the condition of affairs would be so improved, if improved at all, as to warrant an order again scattering the Indians from the San Carlos Reservation over the localities from which they have been heretofore gathered.

MISSION INDIANS IN CALIFORNIA.

The Mission Indians, whose rights were fully recognized and respected by both the Spanish and Mexican Governments, have suffered such wrongs under our Government that they have formed the subject of numerous official reports during the last twenty years. The Executive Departments have done all that was possible to protect them in the possession of their ancient homes and villages, and to repress the encroachments constantly attempted upon their lands, but through the failure of legislative action their situation has grown worse from year to year. Innocent settlers have also doubtless been deprived of just

rights and made to suffer undeserved losses through the inability of the Department to properly discriminate between them and willful trespassers.

A bill for the relief of these Indians, under which it is hoped the rights of both Indians and settlers can be ascertained, defined, and protected, passed the Senate during the Forty-eighth, Forty-ninth, and Fiftieth Congresses, failing each time in the House of Representatives. It was again passed by the Senate during the recent session and was under consideration in the House, but failed to pass from want of time. The necessity for this legislation has been repeatedly shown. The last session of Congress enacted long-delayed legislation looking to adjustment of serious embarrassments surrounding the Round Valley Reservation Indians in California, the Northern Cheyenne Indians in Montana and South Dakota, the Turtle Mountain Chippewas in North Dakota, the Puyallup Reservation Indians in Washington, the Menominee Indians in Wisconsin, and other Indians, and it is earnestly hoped that the measure for the Mission Indians may become a law during the approaching session.

NORTHERN CHEYENNE INDIANS.

Since the last annual report two white men, Ferguson and Boyle, have been killed on the reservation of the Northern Cheyenne Indians of the Tongue River Agency, in Montana. The settlers in the vicinity feel that they have some cause for alarm, and several companies of United States troops have had to be placed on the reservation at different times and places to preserve the peace. The appropriations made by Congress have not been heretofore sufficient to enable the Indian Office to furnish food in such quantities as to prevent hunger among the Indians, and they are charged with depredating upon the cattle of neighboring ranchmen. On the other hand, the Indians themselves have complained of the trespassing of the cattlemen upon their reservation. The investigations made have shown that neither the Indians nor white men have been wholly without fault.

The murders mentioned have, however, produced a strong public opinion among the white people against the whole body of the Tongue River Cheyennes, and it is believed that unless removed from their present location there will be much trouble for them there.

The Northern Cheyenne Indians at this agency, and those located among the Sioux at the Pine Ridge Agency in South Dakota, numbering in all 1,424, are of one tribe and desire to be united. While separated they have been disposed to visit back and forth between the two agencies, neglecting proper efforts for self-support. A survey of the land on the Tongue and Rosebud Rivers in Montana, selected for allotment to these Indians, has shown that there is not sufficient suitable land to make allotments of the areas required by the general allotment act to the Indians already at the Tongue River Agency, to say nothing of

those who are now at Pine Ridge and desirous of going to Tongue River.

For these and other reasons presented to Congress that body has provided by law for negotiations for the consolidation of these Northern Cheyenne Indians and for securing them a suitable reservation on some one of the existing Indian reservations. A commission to conduct the negotiations with these Indians has been appointed by the President, and it is hoped that a suitable home will soon be found for them where they can be permanently located and the work of their civilization begun. In the mean time, and until this is accomplished, an appropriation made by Congress for the purpose at its last session will enable the Department to supply better rations.

INDIAN CONTRACTS WITH ATTORNEYS.

It is appropriate in connection with the foregoing sessions to speak of those contracts made by Indian tribes with lawyers and often unprofessional men to secure their services in obtaining the allowance of certain claims, or to aid in certain negotiations, the fee or compensation being usually contingent upon success. This compensation is in most cases measured by a percentage upon the sum realized, and would often, in case of success, amount to a large sum. All such contracts must now be approved by both the Commissioner of Indian Affairs and the Secretary of the Interior in accordance with the provisions of law relating thereto (Rev. Stats. U. S., sec. 2103, *et seq.*).

These contracts have had for their aim either, on the one hand, to negotiate some demand made by the Indians which would require legal action such as the Indians themselves are incapable of undertaking or even understanding with the advice and assistance of experienced persons, or, on the other hand, to aid apparently in securing for the Indians a fair price for lands in negotiations with commissioners appointed under authority of Congress.

The practice of allowing such contracts has existed for many years, and the compensation paid has been very large at times, although only seemingly small percentage on the sums paid to the principals. But mature reflection and experience have convinced both the Secretary and the Commissioner that such contracts are to be discountenanced. Certainly no more will be allowed with attorneys for any supposed assistance they can give at any negotiations with commissioners for the cession of lands. Ordinarily there is nothing to be discussed between those in possession and the agents of the United States except the price, and on this point the Indian is found quite as apt to know his interest as any one he might employ; on the other hand, the commissioners, as representatives, are not instructed or expected to offer less than the Indian should fairly have. It is not a case of barter between independent parties dealing at arm's length, but an affair between the guardian and the ward—frequently, indeed, the offer by the United

States of a very large sum of money for land the Indians' title to which is wholly dependent upon the will of the Executive. The commissioners are selected for their worth and intelligence, with only such compensation as will meet their expenses, so that their sole motive is to do justice to the Indians as well as to the nation. Moreover, their agreements when secured are subject to either approval by the President or ratification by Congress. There seems small reason to allow any considerable sum for services by attorneys in such cases.

There is, however, reason why contracts in the other class of cases should be approved, at least when the amount to be realized as a fee is graded reasonably according to the talent, experience, and labor involved. Many claims would be lost to the Indians without such assistance. The distinction between the classes is easily perceived.

The Commissioner has expressed himself in harmony with these views in his report, and has further requested that that office may have an appropriation for a solicitor. However, the law force supplied the Department, the Assistant Attorney-General and his clerks, is probably enough to determine any difficult questions of law that may arise when the Commissioner has digested and reported the facts. The Commissioner has a free opportunity to apply to the Assistant Attorney-General through the Secretary for an opinion in any case he may deem proper.

ALLOTMENTS OF LANDS TO INDIANS.

Since the last annual report satisfactory progress has been made in work of allotting lands in severalty.

Under the authority contained in the fifth section of the general allotment law (24 Stats., 388) successful negotiations were conducted with the Sisseton Indians in South Dakota for the cession of their surplus lands, and the agreement entered into for this purpose, which was submitted to Congress early in the session, passed the Senate, but failed to receive favorable consideration in the House of Representatives. The failure to ratify this agreement is a matter to be greatly regretted, as many of the Indians are in a destitute condition, owing to repeated crop failures, due to successive droughts, and are likely to suffer from want during the coming winter. The payment of annuities, long unjustly withheld from them, as provided in the agreement, would have relieved their immediate necessities and secured them against further immediate sufferings.

The field work of making allotments has been entirely completed during the year on the Yankton Reservation in South Dakota, the Grande Ronde Reservation in Oregon, the Modoc, Ottawa, Seneca, and Shawnee Reservations in the Indian Territory, and such work will be finished upon several other reservations at an early day.

An appropriation of \$5,000, made on August 19, 1890, is now available for conducting the negotiation with Indians for cession of their surplus as authorized by the fifth section of the allotment act, and such

negotiations will be entered on as soon as trust patents are delivered and the quality of the the surplus land and the condition of the Indians may warrant it.

A bill to amend the general allotment law, so as to remove the inequality in the quantity of land allowed different classes of Indians, passed both houses of Congress at the last session, but in different form, and therefore failed to become a law. The Senate bill provides for an allotment to married women, leaving the quantity of land allowed minor children and single adults unchanged, while the House bill provides for an allotment of eighty acres to each member of the tribe. In the Secretary's opinion, the latter bill is much more just and will give more general satisfaction to the Indians than the former, each member of the tribe having an equal interest in its common property.

It is hoped that early disposition of the matter may be made, as either measure will require re-allotments and re-adjustment of allotments on reservations where allotments have been completed.

It is also worthy of consideration whether the period now allowed the tribe to determine whether it will receive allotments should not be put under control of the President, so that if he deems it proper in any particular case he may shorten the time for exercising the choice, for as the law stands many tribes give no attention to the subject and delay unreasonably all negotiations.

CATTLE GRAZING ON INDIAN LANDS IN THE INDIAN TERRITORY AND OKLAHOMA.

In the Secretary's last annual report reference was made to the fact that a corporation, established under a State law, was seeking to lease for long periods and at egregiously large prices and for merely grazing purposes certain lands, for the cession of which to the United States a commission appointed under section 14 of the Indian appropriation act of March 2, 1889 (25 Stats., 1005), had been authorized to negotiate, and attention was called to the fact that all such leases, in the then Indian Territory, were illegal and void. On February 17, 1890, a proclamation was issued directing that no more cattle or live-stock should thereafter be brought upon the Cherokee Outlet, and that all cattle or live-stock then on said lands must be removed therefrom not later than October 1, 1890.

In accordance with the Secretary's instructions, the Commissioner of Indian Affairs, on March 29, 1890, issued a notice that all cattle and other live-stock, held on any Indian lands in the Indian Territory under any pretended lease, contract, or other arrangement with Indians for the use of any part or portion of any Indian lands for grazing purposes, must be removed therefrom not later than October 1, 1890.

By proclamation of September 19, 1890, the time for removal of stock from the Outlet was extended to November 1, 1890, as to one-half, and to December 1, 1890, as to the other half, the owners having sub-

mitted a proposition, in writing, agreeing to so remove their stock and abandon all claims to the Outlet.

In harmony with this a similar modification was made in the order for the removal of cattle from the other Indian lands in the Indian and Oklahoma Territories. This policy of exclusion is still deemed the best for all interests involved. It will be in vain to attempt to open the vast regions of the Indian reservations at any reasonable compensation to the Indians if they are allowed to let them to white men for grazing cattle. Although the money received is small compared to that the United States would pay annually as interest for the trust fund derived from the lands, the Indians will prefer the cash which can be lost or spent in a few days each year without the careful control the Government would give. The results are complete bars to advance and the Indian policy is defeated. In many instances there is good reason to believe that the money realized is appropriated by a few among the more designing of the Indians and does not reach the majority of the tribe at all or in but small sums. Moreover these cattle that are pastured are not themselves taxed, and come into the market in competition with the beeves of farmers who pay taxes both on their lands and cattle. Their number and their cheapness are the results of an illegal traffic, and their owners should be allowed no such unjust advantage.

CUTTING AND SALE OF DEAD AND FALLEN TIMBER BY INDIANS.

The Menomonee Indians of Green Bay Agency, Wis., and several of the bands of Chippewa Indians of White Earth Agency in Minnesota early in the fall of 1889 applied for permission from the Department to engage during the winter in cutting and preparing for market dead and down timber on their several reservations. By the act of February 16, 1889 (25 Stats., 673), it was provided that "Whenever there is reasonable cause to believe that such timber has been killed, burned, girdled, or otherwise injured for the purpose of securing its sale, under this act, then in that case such authority shall not be granted." But the reports from the agents gave no grounds for withholding the authority, and it was granted and appropriate regulations to govern the work were prescribed.

The Menomonees, having moderate means and some experience in the work, succeeded during the season in cutting and banking for sale nearly 25,500,000 feet of pine and about 1,000,000 feet of other timber, which, when sold, netted them nearly \$218,000, \$196,000 of which was paid in cash to those engaged in the work, and \$22,000 was deposited in the United States Treasury as a stumpage fund, to be used as required for the support of the poor, sick, and helpless of the tribe, and for the maintenance of a hospital for them.

The Indians connected with White Earth Agency, Minn., were also moderately successful with the season's work, banking about 15,500,000

feet, on which they realized however only \$84,000, not obtaining as good prices as the Menomonees did.

The act of June 12, 1890 (public, No. 153), under which the Menomonees may systematically engage in marketing all their timber, and the main part of the proceeds may be permanently funded for the benefit of the tribe, will be very beneficial to them. Their assent has been given and operations will be carried on this winter.

The law applicable to the right of the Indians in the timber on their reservation is succinctly stated in the Commissioner's report as follows, based upon the opinion of the United States Supreme Court therein cited:

Prior to the decision of the Supreme Court, 1873, in the *George Cook* case, sundry contracts were made with individuals for the sale of surplus timber on several reservations in Minnesota, the funds being applied to the use and benefit of the Indians occupying them.

By that decision it was held that if the lands were desired for the purpose of agriculture they might be cleared of their timber to a reasonable extent. The timber taken off by the Indians in such clearing might be sold, but to justify its cutting, except for use upon the premises, as timber or its product, it must be done in good faith for the improvement of the land. The improvement must be the principal thing, and the cutting of the timber only the incident. Any cutting beyond this would be waste and unauthorized.

The court further held that:

"The timber while standing is a part of the realty, and it can only be sold as the land could be. The land can not be sold by the Indians, and consequently the timber, until rightfully severed, can not be. It can be rightfully severed for the purpose of improving the land, or the better adapting it to convenient occupation, but for no other purpose. When rightfully severed it is no longer a part of the land, and there is no longer a restriction upon its sale.

"Its severance under such circumstances is, in effect, only a legitimate use of the land. In theory, at least, the land is better and more valuable with the timber off than with it on. It has been improved by the removal. If the timber should be severed for the purposes of sale alone—in other words, if the cutting of the timber was the principal thing and not the incident—then the cutting would be wrongful, and the timber, when cut, become the absolute property of the United States.

"These are familiar principles in this country and well settled as applicable to tenants for life and remainder-men. But a tenant for life has all the rights of occupancy in the lands of a remainder-man. The Indians have the same rights in the lands of their reservations. What a tenant for life may do upon the lands of a remainder-man the Indians may do upon their reservations, but no more." (*United States v. Cook*, 19 Wallace, 591.)

NON-RESERVATION INDIANS.

There are scattered throughout the country many Indians who are not located upon any of the existing reservations. Some of them belong to tribes having none; others belong to tribes that have had reservations set apart for them, but have never removed to and settled thereon; and there are others still who have voluntarily abandoned their tribal relations and settled upon the public domain.

Many of these non-reservation Indians are upon lands long in the peaceful, undisturbed possession of their fathers, and but for the rapid

settlement of the country by our own people they might perhaps have continued to remain unmolested for years to come. Of late, however, they have been unable to resist the advancing settlements encircling them, and many have been forced from their homes and dispossessed of the improvements made by them. The number of non-reservation Indians can not be accurately stated, but from information at hand it is reasonable to estimate the same at nearly 20,000, and more than half of these have no interest in any existing reservation. These Indians may also avail themselves of the homestead laws, without fees; but the homestead can not be disposed of to any degree and can not be commuted. The patent merely declares that the United States holds the lands for twenty-five years in trust for the use of the Indian and his widow and heirs, under the laws of the particular State or Territory where it may be, and that at the end of the period named the land will be conveyed, discharged of trust and free, to the party in interest (23 Stats.,—act July 4, 1884).

By the provisions also of the fourth section of the general allotment act any Indian not residing upon a reservation or for whose tribe no reservation has been provided by treaty, act of Congress, or Executive order, may make settlement upon any surveyed or unsurveyed lands of the United States not otherwise appropriated, and he or she will be entitled, upon application to the local land office for the district in which the lands are located, to have the same allotted to him or her and to his or her children, in quantities and manner as provided in the said act for Indians residing upon reservations. Unfamiliar as these Indians are with the land laws of the country, and ignorant of the methods of procedure in acquiring title to the public lands, their homes are often lost, whereas if they understood their rights and knew how to take advantage of them they would be able to protect themselves against all such wrongs.

The registers and receivers are everywhere enjoined and commanded to permit no entries upon lands in the possession, occupation, and use of Indian inhabitants, or covered by their homes and improvements, and to exercise every care and precaution to prevent such entries, if made, from being perfected. They are also instructed to ascertain the lands in the Indian possession and occupancy in their respective districts, and in order to do so to avail themselves of any information furnished them by the officers of the Indian service; that where the fact of Indian occupancy is denied or doubtful, to order proper investigation of the matter prior to the allowance of adverse claims, and when lands are unsurveyed to allow no appropriation of the same within the region of Indian settlements until surveys thereof shall have been made and the lands occupied by Indians is ascertained and defined.

But experience shows it is necessary to have some one to visit, instruct, and assist this class of Indians in making applications for allotments under the section referred to, so that they may secure titles to

their homes. This Department is without the necessary appropriation for this work, and therefore the subject should be brought before Congress, and an appropriation requested for the salary and expenses of a special agent or agents to be charged with the duty of securing lands to Indians under said statutes.

INTRUDERS INTO INDIAN TRIBES.

Attention is drawn by the Commissioner to the question of the rights of persons of mixed blood in the tribes. This question increases in interest with the advancing values of the Indian possessions. Some tribes own enough in land and money to confer on every member a home and a competency for life. The claimants to membership are of every degree of blood, and some who are white point to some far distant ancestor as the source of their right. The question has been mooted most in regard to the alleged intruders in the countries of the Cherokees and Choctaws. Those among the Cherokees remain because of differences as to the rules of law and practice applicable to the subject. The Department is at present disposed, however, to relieve the Cherokees of many who claim to have rights of possession in the Territory, and it is thought some solution may soon be arrived at by mutual agreement.

The number of intruders among the Choctaws is deemed to be not less than five hundred out of the twenty thousand non-citizens now in that country. Serious commotions arose last summer in this nation at election time as to the rights of adopted citizens to vote, and it was feared there might have to be some interference to keep the peace. But the Choctaws and those among them showed such excellent control of their passions and great regard for the public welfare, that the law was preserved, and it was determined to resort only to civil remedies for any grievances believed to exist.

It will, however, soon be necessary to dispose of the question among the Choctaws, as well as among the Cherokees.

If the adjoining territories now negotiated for with the Iowa, the Sac and Fox Indians, and others, could be quickly opened to settlement, it would relieve the situation of its most embarrassing feature, in case decision should be made against large numbers as intruders and they should have to depart to other homes.

INDIAN EDUCATION.

The educational branch of the Indian service has received throughout the year the special attention which its importance demands. The effort has been to extend and improve the system already existing, to enlarge the school facilities, to increase the attendance, to make more uniform the course of study and instruction and to secure teachers of the best qualifications.

The Indian children, with the habits and prejudices of savages and the isolation of each tribe by its own separate language, require a pro-

ness of training and education especially suited to their peculiar conditions. They must necessarily be taught English, and by English-speaking persons, so that at the very outset the teacher in the Indian school has to accomplish an immense task not met in our other public schools, viz, instruction in a tongue foreign to that of the people.

The industrial training schools and reservation boarding schools have been found from experience to be those best adapted to the end in view. Here the pupils are brought under a kindly but strict discipline. They acquire a familiarity with the language, thoughts, customs, and occupations of our civilization and a moral and manual training conducive to habits of industry that will fit them for self support in after years. The boy whose mother was the hewer of wood and drawer of water, the weary burden-bearer for his idle father, now works by the side of his sister and learns that there is no dishonor in labor, but a dignity far beyond that his ancestors ever knew.

The day schools located on the reservations are attempted to be managed so as to be eventually merged into the public-school system if opportunity offers. In them, however, there is little parental authority exerted to keep the unwilling children in attendance, and each day's teaching at the school is almost canceled by each day's return to the camp and its influences. There is some improvement both in the school children and in the disposition of the parents to have them taught; but nothing but compulsion will efficiently fill these schools with pupils, and nothing but constant superintendence between school hours will protect them from recurrence to the bad habits of their homes.

In the last annual report the views of the present Secretary upon Indian education were expressed at length and it is not deemed necessary to repeat them. Upon the lines recommended fair progress has been made. The suggestion of your first message has been acted upon, by placing pupils in the public schools wherever possible.

An attempt to organize into a system the various Government Indian schools has been initiated by adopting a uniform course of study therein and formulating rules for their conduct. This will be followed by the use of the same text-books in all the schools of like grade. Augmented efficiency must surely result from this methodical action. Pursuing the same general course of study, working together by similar methods to the same end, with lower grade schools made systematically tributary to those of higher grade, there will not be that constant loss of previous acquisition now attendant upon each change not only in schools, but even in teachers, as each one has been controlled by almost individual choice.

The teachers and employes are now selected for high personal character and must be thoroughly equipped for their task. Fortunately many such are willing to undergo the privations and sacrifices incident to frontier life among these people. The evil wrought by an unprinci-

pled or unsuitable employé in an Indian school is much greater than it would be elsewhere. These pupils are keenly observant and quick to respond to evil as they would be to good. A single bad teacher may destroy the whole year's work and make the labor of all worse than wasted, so that the precautions must be as searching as the evils resulting from negligence are great. It is gratifying to believe the present employées as a body are worthy, competent, and efficient, and are under the supervision of Indian agents who are sympathetic to the cause of education and good morals.

The national school system is being advanced with extraordinary vigor, and it will now require some conservatism to prevent too great a separation from those denominational schools that have heretofore been encouraged by contracts and whose influences upon the Indians have been beneficial. In your last message you approved the suggestion that while the national school should be supported in case of conflict with these contract schools, nevertheless the church-mission schools are essential in extending education to all the Indian children. They should be welcomed as co-workers in this benevolent cause and treated fairly and generously. Congress has recognized this recently by making several appropriations for contract schools especially named.

The Commissioner furnishes the following:

Table showing the amounts set apart for the various religious bodies for Indian education for each of the fiscal years 1889 to 1891, inclusive.

	1889.	1890.	1891.
Roman Catholics.....	\$347, 672	\$356, 967	\$347, 000
Presbyterians.....	41, 525	47, 680	44, 830
Congregational.....	26, 310	28, 450	27, 271
Martinsburgh, Pa.....	Dropped.		
Alaska Training School.....	Dropped.		
Episcopal.....	18, 700	24, 720	24, 915
Friends.....	23, 383	33, 303	24, 743
Mennonite.....	3, 125	4, 275	4, 273
Middletown, Colo.....	Dropped.		
Unitarian.....	5, 400	5, 406	5, 400
Lutheran, Wittenberg, Wis.....	4, 050	7, 560	9, 150
Methodist.....	2, 725	2, 400	4, 760
Miss Howard.....	275	600	1, 080
Appropriation for Lincoln Institution.....	33, 400	33, 406	33, 400
Appropriation for Hampton.....	20, 040	20, 040	20, 040
Total.....	\$29, 905	\$61, 956	\$54, 528

There are now existing one hundred and fifty-two Government schools and ninety-four contract schools, and the average attendance at the former is 7,424 and at the latter 4,808.

In the Commissioner's judgment the limit heretofore placed by law upon the cost of the buildings—\$10,000—has been so low that it has

been impossible to provide proper accommodations. To establish a boarding-school involves making provision not only for school rooms proper, but for dormitories, kitchen, laundry, bath-rooms, hospital, and other necessary rooms for pupils, and also of suitable quarters for all the employes, superintendent, teachers, matron, cook, laundress, seamstress, etc. The original cost of the plant is a comparatively small part of the outlay. It is a poor economy to put up inferior buildings and fail to make proper provision for the work expected, which can not be satisfactorily done with such poor facilities. The limit of cost now fixed is \$12,000, which is still too low.

It is deemed, however, by the Secretary that the limit should not be passed except upon a careful examination and approval in any particular case by him.

Additional buildings have been erected at the Albuquerque, Chillico, Genoa, and Carlisle training schools. New training schools at Pierre, S. Dak., Santa Fé, N. Mex., and Carson, Nev., have been completed and put in readiness for operation during the current fiscal year. New buildings have been completed for schools on the Fort Hall Reservation in Idaho, the Wichita Reservation in Oklahoma, the Navajo Reservation in New Mexico, the Pima Reservation in Arizona, the Turtle Mountain Reservation in North Dakota, and the Yankton Reservations in South Dakota, and others are now in course of erection on the Fort Belknap, Kiowa, Umatilla, Uintah, and Yakama Reservations. The abandoned barracks of the three military posts of Fort Totten, N. Dak., and Forts McDowell and Mojave in Arizona, constructed and long garrisoned for the protection of the frontier settlers against hostiles, are being put in condition to be used as school-houses for training Indian youth to industry and citizenship. No longer needing these material sanctions of its power, the nation's moral forces are now beating the soldiers' swords into ploughshares and the spears of the savages into pruning-hooks. May they indeed learn war no more!

The Commissioner states that on all Government schools the American flag has been displayed, national holidays have been duly celebrated, the pupils are learning patriotic songs and recitations, being taught to love the great nation of which they are a part, and to feel that the people of the United States are their friends and not their enemies.

The Commissioner also refers to the earnest and unremitting labors of the superintendent of Indian schools, Dr. D. Dorchester, upon whom the duty of personal supervision of the Indian school work is devolved by law. The two hundred and forty-six Indian schools are scattered over a vast area of the United States, and many of them are in localities difficult of access. It is a physical impossibility for one man within the year to do the work assigned him. This is not confined to schools existing, but extends to inquiring into the need of schools where none or too few exist. He has been almost constantly in the field during the

year, going from reservation to reservation and from school to school, with the greatest advantage to the service. He has been accompanied, at the earnest request of the Secretary, by his wife, as a clerk. It was considered that many of the peculiar evils that had marked the schools, particularly among the girls, would be sooner and more completely seen and comprehended by a matron than by another, and that methods of correction would be by her more easily suggested and applied. In this there has been no mistake. The labor has been severe and often most disagreeable for a woman of refinement, but good results have become visible as her visits extended from point to point. The valuable service of the superintendent has been largely supplemented by that of Mrs. Dorchester.

The faithful men and women who do true missionary work by teaching in the Indian schools, leading pure lives of unselfish devotion to this work, have largely contributed to the improvement of the service, and are worthy of most grateful recognition.

INDIAN FARMING.

The purpose of aiding the Indians to become self-supporting by farming, and thereby add to their civilization and general advancement and comfort, has been kept constantly in view during the year, and Indian agents have been repeatedly directed and urged to give their special attention to this duty.

Indian farming is under the supervision of certain farmers employed by the Government for this service. These persons are required to make monthly reports of their work, and are required not only to teach the Indians endeavoring to cultivate the soil, but to induce all of them to turn to this means of comfort and advancement. The Commissioner wishes these agents, or "Indian farmers," to give the Indians somewhat more practical lessons in tilling the soil by example as well as precept. Such "object-lessons," it is believed, will have a beneficial effect upon all concerned.

During the nine months ending June 30, 1890, thirty-five thousand Indians have been instructed and assisted in farming. Nearly twelve hundred who never farmed before have been induced to make a commencement, and some forty-six thousand acres of land have been plowed by them. The results would have been even more satisfactory but for the very severe winter on the western coast and drought on many of the Indian reservations.

A number of the reservations are well adapted for grazing cattle and stock raising may there be made profitable. This industry, wherever the reservations are suitable, should be encouraged, but even this will require constant supervision and instruction before the Indian will be capable of properly caring for the horses and cattle given him.

PURCHASE OF SUPPLIES.

The supplies required for the Indians embrace almost every kind of ordinary merchandise and produce. They are enumerated as follows by the Commissioner:

Beef, bacon, coffee, sugar, lard, hominy, rice, corn and oat meal, salt, hard bread, pork, etc., the annuity goods, agricultural implements, etc., are divided into seventeen classes, as follows:

- | | |
|------------------------|--|
| 1. Blankets. | 10. Furniture and wooden-ware. |
| 2. Cotton goods. | 11. Harness, leather, etc. |
| 3. Woolen goods. | 12. Agricultural implements. |
| 4. Clothing. | 13. Wagons and wagon fixtures. |
| 5. Boots and shoes. | 14. Paints and oils. |
| 6. Hats and caps. | 15. Brass and iron kettles, tin and tinware. |
| 7. Notions. | 16. Stoves, hollow ware, pipe, etc. |
| 8. Groceries. | 17. Hardware. |
| 9. Crockery and lamps. | |

In addition there is also purchased a large number of articles of medicine, surgical instruments, books, and school supplies, numbering in all over 2,500 articles. Over 50,000 samples were submitted, examined, and passed upon.

The total number of bids received last year was 558, and 244 contracts were awarded.

It is not deemed that in every instance the lowest bid should be accepted, as often the quality of the goods offered at a low price would be dearer than better at a higher price.

There has been the greatest care taken to prevent fraud in these contracts or in the delivery of the goods. Besides the Commissioner and the Indian commisisoners, some of whom usually attend at the bidding, the Assistant Secretary of this Department has been present as well as at the delivery. The inspectors selected have been the very best and most reputable that could be secured; the contract is accompanied by a bond for 50 per cent. of its amount, and upon shipment the invoices are made out in quadruplicate, the original for the Treasury, one for the Bureau, one to the agent or school superintendent, and the other to accompany the bill of lading when payment is made for the transportation for purpose of identification. Last year there were 30,000 invoices thus required.

Formerly the struggle was constant to deceive and cheat the Government both in the sample at bidding and in the goods at delivery. It had gone to such an extent that honest merchants were largely driven from this market. But it is gratifying to state that by constant watchfulness and firmness these evils have been almost entirely destroyed. The market at the warehouse in New York is so far redeemed that it stands high in that commercial center for fairness in judgment and treatment, and the contracts recently made have been of a most satisfactory character and the deliveries acceptable.

It has cost more effort than was anticipated to bring about this reform; but to the Secretary's determination has been added the zeal and

intelligence of the other officers named participating in the actual transactions. It is thought that the education of the savage must commence in New York City, for it is there his physical comfort must be secured and the foundation laid for his confidence in the honesty of the white man. Without these the school teacher's task will be made much more difficult. Besides, it seems the greatest of indignities to offer the Government for a dishonest man to strive to cheat, when the people's money is being spent for the protection of the frontiers from the passions of savages aroused by their hunger and all manner of physical discomfort, joined to their sense of wrong in being refused what has been promised and what would be delivered but for the fraud of the contractor. It is hoped that the field for illegal speculation will no longer be found in this quarter.

IMPROVED METHODS OF DISTRIBUTING SUPPLIES.

A plan of issuing rations at sub-stations upon many of the large reservations has been adopted and begun to be practiced. Many Indians reside at a distance from the agency, and, having but little restraint upon their appetites, when they receive their rations from the agent they consume them with great voracity on their return journey, so that they vibrate in almost constant motion between their camps and their depot of supplies. The distances are often 50 or even 75 miles, and the persistent migration utterly neutralizes all efforts to teach them farming or otherwise permanently improve their condition. Hereafter it is intended to have the rations nearer at hand, and to give the Indian such regularity of food as will enable him to devote the time now used in either a struggle with hunger or sacrificed to the indolence produced by overeating to cultivation of the soil, industrial pursuits, home life, and education.

A reform has also been inaugurated in distributing beef. Heretofore the live cattle have been started one, two, or three at a time from the corral with a lash and a cry, out to the expectant Indians upon the adjoining prairies or open ground. These, mounted and armed with repeating rifles, set upon the already frightened animals with whoop and random firing to drive them nearer the camps before actually killing the victims. Here and there, near and far, the mimic buffalo hunt is seen in progress, until, as the destined points are reached, the fatal shot is given, and as the animal falls it is surrounded by the squaws and men and children, and often eaten in large part before fairly cold. It is amazing the practice has been allowed so long, wasteful and barbarous as it is. The Commissioner has now ordered all this to cease, and that slaughter-houses be built and used under supervision of proper employes, and there is no doubt but that the benefits of this more civilized method will be very great to the Indians. Among other things there will be a better opportunity to inspect the beeves under the new

system than has probably existed in the rather rapid delivery to the consumer heretofore in vogue.

Further improvements conducive to the protection of the Indian from the fraud and imposition that have been so greatly practiced upon him, are already in operation, and will be advanced until the Indian service shall be what it should be, the most just, the most honest, the most progressive, and the most humanizing under the Government's control. It is very gratifying to the Secretary to be able to say that, by the aid of his Assistant Secretaries and of the Commissioner and Assistant Commissioner of Indian Affairs, the morals, tone, and efficiency of this service has been greatly improved, and the outlook for the Indian is becoming brighter every day.

"WILD WEST" SHOWS.

When the present administration began there was little or no restraint upon any seeking to take Indians off the reservations for exhibition in this or other countries. The first act done by the present Secretary was to require a bond of any person asking such privilege, conditioned on the fair payment and treatment of the Indians and their return to their homes, and for the employment of a white man to be selected to go along with the Indians and look to their rights and welfare. This, it is thought, did much good in some cases; but experience has shown since that in other cases the Indian has greatly lost by such employment. He is taken into strange and most exciting surroundings, he is taught to renew the wildest and most savage scenes of Indian warfare, and too often tempted to recur in practice to the lowest vices. When misfortune overtakes him in any form of disease or accident, or bankruptcy breaks up the show of his employer, his condition on return home is not a good object-lesson of the benefits of civilized life as found by him in the capitals of our own or other enlightened lands. The results are, in fact, deplorable, and it has been ordered that no more such licenses or contracts shall be made or approved, and that all Indian agents shall exert themselves to prevent and defeat any attempts in future to take Indians from the reservations or elsewhere for such purposes.

If some act of Congress were passed forbidding any person or corporation to take into employment or under control any American Indian, it would be of much assistance to the Department in enforcing this policy.

INTEMPERANCE.

Further legislation is also needed to enable the Commissioner to contend successfully with the great evil of intemperance, as he sets forth in his report. The international feature, as well as the constitutional question connected with the subject are by him so fully detailed that it is not deemed necessary to do more than refer to them here.

His suggestions are heartily recommended to your favorable consideration.

FUNDS.

The Indian funds continue in good condition, as shown by the following tables, computed in the Indian Office :

Trust funds of the five civilized tribes.

Of the \$21,244,818.39, principal held in trust, the sum of \$7,984,132.76 belongs to the five civilized tribes in the following proportions:

Tribes.	Amount of principal.	Annual interest.
Cherokees	\$2,675,842.37	\$137,489.38
Chickasaws	1,308,695.45	66,484.95
Choctaws	549,594.74	27,544.73
Creeks	2,000,000.00	100,000.00
Seminoles	1,500,000.00	75,000.00
Total	7,984,132.76	412,219.01

The interest on the principal of these funds is placed semi-annually with the United States assistant treasurer at St. Louis, Mo., to the credit of the treasurer of each nation, and the expenditure of these funds is entirely under the control of the nation and its council. This office has no control whatever over these expenditures.

TRUST FUNDS OF OTHER TRIBES.

The balance of the sum of \$21,244,818.39, amounting to \$13,260,685.63, belongs to a number of tribes, as stated below, and the interest thereon, at 4, 5, 6, and 7 per cent., as the case may be, is either paid to or expended for the benefit of the respective tribes.

Table showing trust funds of tribes other than the five civilized tribes.

Tribes.	Principal.	Tribes.	Principal.
Chippewas and Christian Indians	\$42,560.36	Pottawatomies	\$184,094.57
Delawares	874,178.54	Sacs and Foxes of Missouri	21,629.12
Eastern Shawnees	9,079.12	Sacs and Foxes of the Mississippi	55,052.21
Iowas	171,543.37	Santee Sioux	20,000.00
Kanews	27,174.41	Senecas	40,979.60
Kaskaskias, Peorias, Weas, and Plankeshaws	58,000.00	Senecas, Tonawandas band	50,000.00
Kickapoos	129,184.08	Senecas and Shoshones	15,140.43
L'Anse and Vieux de Sert bands	20,000.00	Shawnees	1,000.00
Menomonees	163,030.38	Stock bridges	73,982.00
Onges	2,255,268.49	Shoshones and Bannocks	0,000.00
Ojibwas	240,597.57	Umatillas	50,461.01
Ojoss and Missourias	590,175.43	Utes	1,750,000.00
Pawnees	292,625.07	Utah and White River Utes	2,240.00
Poncas	70,000.00	Total	12,260,685.63

The following is the total money available for fiscal year ending June 30, 1891:

Sources.	Amount.
Appropriations	\$7, 127, 394. 69
Balances	1, 385, 759. 56
Interest on trust funds	1, 058, 276. 87
Interest, balances	967, 406. 43
Total	10, 538, 837. 55

INDIAN DEPREDAATION CLAIMS.

It will be seen by the report of the Commissioner of Indian Affairs that the whole number of depredation claims filed prior to the end of the last fiscal year was 6,053, amounting to the sum of \$20,922,939; that of this number 220, amounting to \$216,380.83, were certified to the Second Auditor for payment prior to the passage of the act of May 29, 1872 (17 Stats., 190); that 52, amounting to \$208,140.10, have been paid under authority of various acts of Congress prior to March 3, 1885; that 2, amounting to \$10,050, have been paid by acts of Congress since March 3, 1885; that under the provisions of law contained in the Indian appropriation acts of March 3, 1885 (23 Stats., 376), and of May 15, 1886 (24 Stats., 46), providing for the investigation and submission to Congress of "certain Indian depredation claims," 1,097 claims, amounting to \$3,828,284.65, had up to and including January 1, 1890, been reported to Congress with recommendation for allowance thereon of \$1,205,446.40, and that there remained on file June 30, 1890, 4,682 claims, amounting to \$16,310,385.93, of which 1,809, amounting to \$6,657,430.05, are not considered subject to investigation under the law above referred to for the various reasons stated.

When it is considered that many of these claims, already ascertained to possess considerable merit, have been pending for more than a generation, it would seem that some legislation looking to their final adjudication should be enacted. Unless Congress shall determine that some other method for their settlement is necessary, and shall adopt the requisite legislation therefor, it is suggested that the laws should be so amended as to remove the technical bars against consideration of some of the claims referred to by the Commissioner, and that the clerical force in the Indian Office be so increased as to insure their speedy investigation and settlement. As time passes, it becomes more difficult to obtain the testimony necessary for the claimants to substantiate their losses, and for the Government to protect itself against and prevent frauds. The first provision for the payment of claims of this character was made in the act of 1796, and, so far as has been ascertained from the records of the Indian Office, it does not appear that more than 274 of such claims, amounting to \$434,570.93, have

been paid. This sum is but a fraction over 2 per cent. of those which have been filed. The bill now pending before Congress, entitled "A bill to provide for the adjudication and payment of claims arising from Indian depredations," has received the consideration of the Secretary and is deemed such as will grant the relief necessary in these cases. And it is hoped it may become an act before the adjournment of the Fifty-first Congress.

SALARIES OF BUREAU OFFICERS.

In the last annual report it was urged that additional compensation be given the several heads of bureaus and their assistants, where the importance of the work justified such recommendation. Congress increased the salary of the Commissioner and Assistant Commissioner of the General Land Office, but it is regretted that no increase of the salaries of the Commissioner and Assistant Commissioner of Indian Affairs and of the financial clerk of that Bureau, as recommended, was made. The Commissioner also asks an increase of force, as follows, which is hereby recommended:

There is urgently needed at once the following additional clerical help: One clerk of class 4, two of class 3, and three of class 2; also one medical expert, charged with an oversight of the sanitary condition of the Indians.

Without sufficient help in the office it is simply impossible to have the work done as it should be. Those now employed are faithful, industrious, and generally competent, but the work is too much for them and must and does suffer. The Commissioner is painfully aware of this fact, but is powerless to help it.

The Indian Bureau has a delicate task to perform, more delicate perhaps than others, from the fact that those under its care are ignorant and need the peculiar protection of the Government in the administration of their affairs, and its guidance in their efforts at civilization and self-support.

The duties and labors of the Indian Bureau are constantly increasing. As the Indians advance in civilization the Bureau has to deal more with the individual Indian and less with the tribes. Intricate questions of individual rights and interests require painstaking and intelligent investigation while the Indians are undergoing the process of tribal disintegration. The efficient performance of the exacting labors and duties of the position require ability and capacity that warrant equivalent and fair compensation.

The Assistant Commissioner of Indian Affairs, who, under the law, performs also the duties of chief clerk, and must often act as Commissioner of Indian Affairs in conducting the business of the Bureau, receives a salary of \$3,000 per annum. His duties are arduous and burdensome, as all matters of business of the office must, by the nature of his position, first receive his consideration and direction as to the proper action to be taken. The services of the present Assistant Commissioner are specially valuable by reason of his long experience, his thorough acquaintance with so much of the past history of the Indian

tribes, his familiarity with the details of the service, records, files, and with the decisions pertaining to all its important matters. It is again most earnestly recommended that his salary be increased to \$4,000 per annum, as estimated for.

The financial clerk of the Indian Office, who is also the chief of the Finance Division of the Indian Bureau, receives a salary of \$2,000 per annum. The Commissioner of Indian Affairs has asked, in his estimate for the fiscal year 1892, that it be increased to \$2,500, and the Secretary recommends this increase. Such a clerk's duties are important; much of his work is of a character which requires it to be performed by himself; to assign it to others would risk confusion and deficiencies in appropriations, of which there are over three hundred and thirty, to be carefully apportioned and watched. It is stated that he has performed much of his work outside of office hours, and he is justly entitled to the increased salary asked for.

PATENT OFFICE.

RECOMMENDATIONS.

The Commissioners' report, it will be understood, is to be followed, as required by law, by a more elaborate one to be presented to Congress. This, to the Secretary, furnishes, however, many interesting facts, showing a great advancement in the work of the Bureau, and a most praiseworthy increase in its receipts over its expenses. There is no bureau that has earned by its own success greater claims to an increase of force and room for its officers and clerks than the Patent Office, and the Secretary strongly approves the recommendations of the Commissioner hereinafter set forth.

RECEIPTS AND EXPENDITURES.

The total number of applications received, including re-issues, trademarks, designs, etc., was 46,140; the number of patents granted was 25,857; trade-marks and labels registered, 1,636; patents expired, 11,885; the total receipts were \$1,347,203.21; the total expenditures were \$1,081,173.56, leaving a surplus of \$266,029.65 to be turned into the Treasury of the United States to the credit of the Patent fund, and making a total balance in the Treasury on account of the Patent fund of \$3,790,556.28. The Commissioner directs attention to the great increase in the number of applications received and reports that despite such increase the number on hand and in condition for action at the end of the fiscal year was less than at the corresponding period in either of four previous years; that the work of the office is more nearly up to date than it has been for years, a result due to no increase in the number of employes, but to the unflagging industry and well-directed skill of the entire office force.

Comparative statement.

	Receipts.	Expenditures.
June 30, 1886.....	\$1,200,167.80	\$391,829.61
June 30, 1887.....	1,150,046.05	361,644.38
June 30, 1888.....	1,122,994.63	333,730.11
June 30, 1889.....	1,146,557.22	394,637.34
June 30, 1890.....	1,347,203.21	1,081,173.08

Increase in the number of applications for patents, including re-issues, designs, trade-marks, and labels.

June 30, 1886.....	32,872
June 30, 1887.....	32,948
June 30, 1888.....	37,746
June 30, 1889.....	39,797
June 30, 1890.....	43,839

Number of applications awaiting action on the part of the office.

July 1, 1886.....	6,772
July 1, 1887.....	7,601
July 1, 1888.....	7,227
July 1, 1889.....	7,873
July 1, 1890.....	6,265

LEGISLATION.

Attention is invited to the urgent necessity for legislation amendatory of the Revised Statutes relating to patents. Some of the provisions which should be altered are: Section 4935, relative to the payment of patent fees; section 4887 relating to the duration of patents for inventions previously patented in a foreign country; section 477, fixing compensation of examiners-in-chief, and section 4910, authorizing appeals from the examiners-in-chief to the Commissioner of Patents; and section 4934, relative to charges for certified copies of printed matter. The amendment of the act of Congress relating to the registration of trade-marks, approved August 5, 1882, so as to include trade-marks used in interstate commerce, is also recommended.

ADDITIONAL FORCE AND ROOM.

The Commissioner directs attention to the inadequacy of the present office force, referring to the fact that the Government undertakes, on behalf of the inventor, not only to give him a patent if his improvement is new and useful, but to conduct a painstaking examination in order to ascertain what the fact is in that regard, and expresses the opinion that the number of cases acted upon in the Patent Office during recent years is inconsistent with the high degree of care in conducting examinations which the present patent system contemplates. He urges, therefore, in view of the large increase in the number of applications for patents, the necessity for more deliberate and exhaustive examinations, and of the further fact that American inventors are already

paying for the necessary expenses, that a substantial increase in the examining corps, etc., of the office be made.

The Commissioner calls attention to the fact that there are seventy-six copyists in the Patent Office receiving a salary of but \$720 per annum, whereas the lowest salary paid copyists in the other bureaus of the Department is \$900. He submits that this discrimination is unjust and unwise and has the effect of causing the loss from time to time of trained employes, who seek transfers to other bureaus in which for the same service they will receive \$900.

The Commissioner refers to and reiterates his remarks in the last annual report as to the necessity for providing additional room for his office, and states that the same situation continues to exist, excepting that the imperative need for a larger force increases the necessity for more room.

PENSIONS.

The work to be done by this Bureau has reached wonderful proportions, and its expenditures have sent into the channels of trade and commerce in our country more than one hundred millions of dollars the past year. The use of this vast sum has served more than one valuable purpose. It has been not alone a relief to hundreds of thousands of the families of the soldiers who in different wars have served their country, chiefly those who defended the Union against secession; but it has also transferred at most opportune moments the accumulated treasures of the Government to the hands of the people, "blessing him that gives and him that takes."

The pensions granted by previous legislation will be largely augmented by those now being allowed under the act entitled "An act granting pensions to soldiers and sailors who are incapacitated for the performance of manual labor, and providing for pensions to widows, minor children, and dependent parents," approved June 27, 1890.

This bill was passed in accordance with the strong recommendation contained in your message at the opening of the Fifty-first Congress. A recommendation to the same effect was contained in the Secretary's last annual report. It was there said:

The preservation of the nation for which these men fought and endured so much to secure has given to all our people a wonderful degree of prosperity and an almost unlimited ability to pay any obligations honor imposes. I am not disposed to confer upon all who may ask the money of the people, and would have confined to well ascertained limits the claims of those who demand a pension. Nevertheless a disregard of those of the service named whose disability has become since the war so great as to make them dependent would be both unjust to them and unworthy of our country.

The act of June 27 fairly complies with these demands and in connection with previous legislation places our nation above any other in expressions of gratitude to its defenders and fair compensation for their sacrifices.

It may be well to mention here that the reason why our pension-roll is greater than that of other countries is not alone because the war was colossal, having enrolled nearly two and a quarter millions of men on one side, but because, the country they saved being a Republic, each individual of that vast army had a recognized claim to the aid of the nation. In other lands officers get much and men little; here the large bulk of pensions goes to the rank and file, and the immense numbers of these and their dependents swell the pension list to proportions commensurate with the size of the army and the democracy of our principles.

ROLLS AND CLAIMS.

At the close of the fiscal year 1890 there were 537,944 pensioners borne upon the rolls. Their classification is given by the Commissioner as follows:

Army invalid pensioners	392,859
Army widows, minor children, and dependent relatives	104,456
Navy invalid pensioners	5,274
Navy widows, minor children, and dependent relatives	2,460
Survivors of the war of 1812	413
Widows of soldiers of the war of 1812	3,610
Survivors of the Mexican war	17,128
Widows of soldiers of the Mexican war	6,763
Total	537,944

At this writing (October 18, 1890) there are claims pending, 892,221. Of these there have been received under the act of June 27, 1890, 483,278. It may be explained that many of the new claims are by those who have old claims pending, so that the number of claims are many more in number than the persons making them.

It appears from the Commissioner's report that—

There were 66,637 original claims allowed during the year, being 14,716 more original claims than were allowed during the fiscal year 1889 and 6,385 more than were allowed during the fiscal year 1888.

The amount of the first payment in these 66,637 original cases amounted to \$32,478,841.18, being \$11,036,492.05 more than the first payments on the original claims allowed during the fiscal year 1889, and \$10,179,225.72 more than the first payments on the original claims allowed during the fiscal year 1888. The average value of the first payments on these original claims for 1890 was \$485.71. The average annual value of each pension at the close of the fiscal year was \$133.94.

WHO MAY SECURE PENSIONS.

The classes of persons who may secure pensions under existing laws are as follows:

Under sections 4692 and 4693, Revised Statutes, United States, those next following numbered 1, 2, 3, 4, and 5.

(1) Any officer, including Regulars, Volunteers, and Militia, or any

officer of the Marine Corps, or any enlisted man, however employed in the military or naval service of the United States, or in its Marine Corps, regularly mustered or not, disabled by reason of any wounds or injury received or disease contracted when in service and in line of duty.

(2) Any master serving on a gun-boat, or any pilot, engineer, sailor, or other person not regularly mustered serving upon a gun-boat or war vessel of the United States, disabled by any wound or injury received, or otherwise incapacitated while in the line of duty for procuring his subsistence by manual labor.

(3) Any person not an enlisted soldier in the Army serving for the time being as a member of the militia of any State, under orders of an officer of the United States, or who volunteered for the time being to serve with any regularly organized military or naval force of the United States, or who otherwise volunteered and rendered service in any engagement with rebels or Indians, disabled in consequence of wounds or injury received in the line of duty in such temporary service; but no claim of a State militiaman or non-enlisted person shall be valid unless prosecuted to a successful issue prior to July 4, 1874.

(4) Any acting assistant or contract surgeon, disabled, etc., in line of duty.

(5) Any provost marshal, deputy provost, or enrolling officer disabled by reason of any wound or injury, received in the discharge of his duty, to procure a subsistence by manual labor.

(6) The widows and minor children of those embraced in sections 4692, and 4693, by force of section 4702.

(7) Widows of colored and Indian soldiers and their minor children, by force of section 4705.

(8) Dependent mothers, fathers, and brothers and sisters of those embraced in sections 4692 and 4693, by force of section 4707.

(9) Officers and seamen of the Navy disabled prior to March 4, 1861, by force of section 4728.

(10) Widows and minors of officers and seamen of the Navy disabled prior to March 4, 1861, by force of section 4729.

(11) Regulars or volunteers disabled in the Mexican War, by force of section 4730.

(12) Widows and children of regulars or volunteers who died by reason of injuries or disease contracted in the Mexican War, by force of section 4731.

(13) Widows and minor children of persons engaged in the Mexican and various Indian wars, by force of section 4732.

(14) Soldiers and sailors who served in the war of 1812, by force of section 4736.

(15) Surviving widows of officers, soldiers, and sailors of the war of 1812, by force of section 4738.

(16) Officers and seamen of revenue cutters who have been or may be disabled or wounded in discharge of their duty while co-operating with the Navy by order of the President, by force of section 4741.

(17) Wounded privateermen, by force of section 4701.

(18) Widows, children, dependent mothers and fathers, or orphan brothers and sisters of those soldiers who were murdered by guerrillas at Centralia, Mo., in 1864, by force of act of March 3, 1875.

(19) Surviving soldiers and sailors of the Mexican war, and the widows of the same, by force of act of June 29, 1887.

(20) Soldiers and sailors of the war of the rebellion who served ninety days and were honorably discharged the service, and who are incapacitated for performance of manual labor, and for their widows, children, and dependent parents, by force of act of June 27, 1890.

APPROPRIATIONS.

The appropriation for the last fiscal year was but \$80,000,000. This, as was pointed out in the Secretary's last annual report, was not only inadequate, but must have been known to be so when made; for the estimate of the year before was \$80,000,000, and there had been then incurred a deficiency of at least \$8,000,000, and, as the pension list was constantly increasing, it was apparent that this additional sum, if added, would not be enough to meet the obligations to accrue before the end of even that fiscal year. So it proved; the appropriations were as follows:

For the fiscal year 1889:

Act of June 7, 1888	\$80,473,000.00
Act of March 2, 1889	8,000,000.00
Total	<u>88,473,000.00</u>

For the fiscal year 1890:

Act of March 1, 1889	\$80,473,000.00
Act of April 4, 1890	21,598,834.00
Act of June 18, 1890	3,708,732.35
Total	<u>105,780,732.35</u>

At the close of the fiscal year there remained in the hands of pension agents the sum of \$580,283.87 of the pension fund which had not been disbursed for want of time and which has been returned to the Treasury; and there were 20,638 pensioners unpaid at the close of the fiscal year who were entitled to receive \$4,357,347.30 which has since been paid from the appropriation for the fiscal year 1891.

These facts are fully set forth in table No. 5, Commissioner's report.

The appropriation for the present year is \$97,090,761, but such has been the great number of pensioners added to the list by special acts of Congress and the energetic work of the Bureau that a deficiency appropriation will be required, the amount of which can not yet be accurately stated.

The energetic work under the present administration of the bureau has been already specified. But its force has been largely increased and its work will be much greater than even heretofore. By the act of June 27, 1890, the employment of an additional force of 438 medical examiners, clerks, and other employes was authorized, in addition to which 175 clerks have been ordered from the field where they were employed as special examiners, thus adding, with the 438 above mentioned, 613 to the force employed in the office on September 1; and the whole number of officers and employes on the roll is 1,662.

The Commissioner's report for the week ending October 18, 1890, shows the number of articles of mail matter received to have been (for the week) 76,614; number of letters and blanks sent out, 69,194. The total number of claims received during the preceding week was 26,811 of which 20,800 were under the act of June 27, 1890.

The whole number of claims on file October 11 was 870,316; 26,811 were received and 486 re-opened, making the sum 897,613. But 5,392 were disposed of in the same time, so the number pending October 18, 1890, was 892,221.

The Commissioner has considered the question as to the number of our old soldiers very carefully, and has expressed his judgment in the following table:

Number of soldiers enlisted during the war for the Union, excluding re-enlistments	2, 213, 365
Number killed in battle and by other casualties and who died of disease to July 1, 1865.....	364, 116
Estimated number of deaths of soldiers discharged during the war to July 1, 1865.....	25, 284
Number of desertions	121, 896
	<hr/> 511, 296
Number of survivors of the war July 1, 1865, less deaths and desertions	1, 702, 069
	<hr/>
Number of survivors July 1, 1865, less deaths and desertions, who were subject to the usual laws of mortality	1, 116, 069
Number of survivors July 1, 1865, who, because of wounds and other disabilities were subject to a higher rate of mortality, equal to twelve years' shortening of the expectation of life ..	586, 000
	<hr/>
Number surviving July 1, 1890, who are probably subject to the ordinary life tables.....	831, 089
Number surviving July 1, 1890, who are subject to a greater death rate.....	415, 000
	<hr/>
Total number of survivors July 1, 1890	1, 246, 089

Of the foregoing number of survivors about 106,000 are now sixty-two years of age and upwards.

The estimate for Army and Navy pensions for 1892 is about \$133,000,000.

METHODS OF BUSINESS.

The great work of this Bureau, the results of which draw so heavily upon the National Treasury, and should therefore be scrutinized with the utmost care, is done at present upon a thorough business basis. All claims on which large first payments may accrue are carefully examined by the Deputy Commissioner and Commissioner before allowance. Rejected claims are re-opened only upon order of the Deputy Commissioner. The Medical Division has been reorganized, strengthened, and put under stricter rules. The Finance Division scrutinizes all accounts pertaining to the Bureau, and especial care is taken that all letters from claimants be replied to without delay. The board of re-review that operated rather to obstruct the allowance of just claims than to advance the interests of the Government, has been abolished and the force distributed among the other divisions. By extraordinary efforts the cases in the hands of special examiners in the field have been reduced in the last year from 14,225 to 7,824, including those passing from and to the office.

As a part of the new system of practice in the Bureau, the Commissioner adopted the "completed files," which allows the claimant, upon a proper certification that his claim is complete, to have it immediately placed upon these files, and taken up in its order for adjudication. Formerly the applicant, although he had presented his demand on all the evidence necessary to prove it, had no power to get the claim before the adjudicating division, and thus secure his certificate. The rules against making a case special prevented its advancement, save in very particular cases of great privation or the imminence of death. There grew up such an evil formerly of making many cases "special," that it had to be ended by a strict order from the Department. It appeared also that under the completed files system many cases had been foisted into these files, and thus brought within range of earlier adjudication than they were entitled to, being in fact incomplete, so that an order against this and kindred offenses was deemed necessary. The Secretary, therefore, on the date thereof issued the following:

SEPTEMBER 26, 1890.

It is hereby ordered, That under the rules already in force, and those this day approved, for the purpose of securing the prompt adjudication of claims under former acts of Congress, and that of June 27, 1890, such action shall be taken by all officers and employes in the Pension Bureau as will prevent any undue preference of any claim in time of either hearing or adjustment; and any agent or attorney who shall have or attempt to have any claim put upon the list or docket of or among the completed files, that is obviously or clearly not complete, or otherwise defeat the just operation of the laws and regulations, shall be barred from practice in the Department.

It is hoped that the system thus guarded may prove as fair as it is rapid.

DEPENDENT PENSIONS.

The work under the law of June 27, 1890, has been so arranged that dependent pensions will be adjudicated as rapidly as they are completed without interfering with completed claims under the old law. Under order No. 162, September 26, 1890, claimants under the dependent pension law are given the benefit of all proofs that may have been filed in claims made by them under other laws. The details are furnished in the very carefully prepared and accurate report of the present Commissioner of Pensions. It is deemed one hundred thousand claims are already in the Pension Office that can be allowed under this order.

ACTS OF MARCH 3, 1883, AND MARCH 4, 1889.

The Commissioner draws attention to the great difference in amount between the rate of \$30 per month granted by the act of March 3, 1883, to pensioners who are so disabled as to be incapacitated for performing any manual labor, and the rate of \$72 per month granted by the act of March 4, 1889, to pensioners who require the regular aid and attendance of another person. There are many claimants, he says, who are entirely incapacitated for performing manual labor and who periodically require the aid and attendance of other persons, but who are unable to establish the fact of the requirement of constant aid and attendance. His recommendation that a rate of \$50 per month be created for cases of this description is approved.

ACT OF APRIL 4, 1890.

This act directed that, as far as practicable, the Commissioner should in his annual report state the amount paid for pensions during the fiscal year for which the report was made in such manner as will show separately the number of pensioners, the aggregate payment of pensions on account of each of the wars for which pensions have been authorized, and on account of military and naval services since the close of the late war. The Commissioner reports that to comply with this demand would require an examination of each of 775,310 cases on file, and the force that would have to be assigned to the work would defeat the adjudication of pending claims to a degree that was not probably contemplated by Congress and would greatly impair the usefulness of later legislation.

FORCE OF THE PENSION BUREAU.

The official force of the Bureau of Pensions is as follows:

New authorized by law	2,000
There are 18 pension agents and 419 persons employed at said agencies, in all	437
There are 1,028 boards of medical examiners, of three persons each, and 382 single surgeon examiners, in all	3,460
Total number of persons employed in connection with the Bureau of Pensions	5,906

BOARD OF PENSION APPEALS.

This board is established in the Department proper, and has jurisdiction on appeals to the Secretary from the adverse action of the Commissioner of Pensions; on the disposition of such other appeals from the Commissioner as involve questions of attorneyship, and fees in pension cases; and also the attendant correspondence.

The following embraces substantially the points decided on all the questions that have arisen under the law of June 27, 1890, as set forth in the report of the Assistant Secretary:

1. The act of June 27, 1890, does not require that an application or declaration shall be executed *after* the date of the act in order to be good in law. The statutory limitation relates exclusively to the date of *filing* the application or declaration in the Bureau of Pensions after the passage of the act.

2. Where a soldier already has a claim for invalid pension "pending in the Bureau of Pensions," his declaration having been executed under said "pending" claim, prior to the passage of the act of June 27, 1890, he may file a supplemental application asking the Commissioner of Pensions to consider the evidence in the heretofore pending claim with a view to allowing pension under the act of June 27, 1890, without affecting his pensionable rights under any other law, general or special.

3. The only application that may be *filed* must be executed in conformity with the act of July 1, 1890, in such form as the Commissioner may prescribe; and none other than a *formal* application will be recognized by either the Commissioner of Pensions or the Secretary of the Interior.

Again, in response to interrogatories calling for an interpretation of other clauses of the aforesaid act, July 15, 1890, I communicated to the Commissioner of Pensions an additional ruling whereby the Department *holds*, viz.:

1. The act of June 27, 1890, does not change the essential conditions of *dependence* as affected by remarriage and as defined by former laws on the same subject, but makes the pension itself begin from the date of filing the application; nor are non-enlisted men, such as quartermasters' employés, entitled to the benefits of this act.

2. The act of June 27, 1890, includes, constructively, section 4708, R. S., relating to the *remarriage* of "any widow, dependent mother, or dependent sister;" but the act makes no provision for the *restoration* of pensionable rights which may have been forfeited by *remarriage*, in pursuance of the statute. With reference to pensionable dependence under the act of June 27, 1890, the limitation under former enactments, requiring proof of "dependence at the date of the death" is removed, and it shall be necessary only to show *present dependence*, or the lack of present means of support other than claimant's own manual labor.

3. The date of pensions granted under this act must be the date of "the filing of a *formal* application," either on or after the date of the passage of the act itself; and the *formal* application is necessary to a faithful execution of the law.

AMENDMENTS SUGGESTED.

The Secretary concurs in the following amendments suggested by the Assistant Secretary.

In the second section of the act of June 27, 1890, it is provided that, "persons who are now receiving pensions under existing laws, or whose claims are pending in the Bureau of Pensions, may, by application to the Commissioner of Pensions, in such form as he may prescribe, showing themselves entitled thereto, receive the benefits of this act." In view of this provision, that, in many cases wherein "claims are pending in the Bureau of Pensions," but wherein appeals to the Secretary have been

sled, the adjudication of the same would be greatly facilitated, and the ends of justice sooner reached, if the aforesaid section should be so amended as to authorize the Secretary, when adjudicating said appeals under the old laws, to allow pension under the new law without a formal *application* to the Commissioner, where, from the evidence in the papers, it shall be clear that the claimant was *entitled* to pension under the new law. The amendment thus suggested would save expense, labor, and delay to many worthy claimants, and relieve the Bureau of Pensions of a heavy burden in the administration of the law.

With reference again to this act, attention is called to that clause in its third section which provides pension for *minor* children who are "insane, idiotic, or otherwise permanently helpless." The clause properly provides that the pension granted to such children "shall continue during the life of said child, or during the period of such disability;" but, under the law, as it stands, in order that such children shall be pensioned during life, or "during the period of such disability," it must appear that the father, or the mother, died *prior to the expiration* of the limit affixed to the pensionable minority period, viz: *sixteen years of age*; and, therefore, if, when the parent dies, the insane, or idiotic, or otherwise permanently helpless child is *more* than, instead of "*under, sixteen years of age,*" a minor's pension can not be allowed. In view of this fact, the act should be so amended as to admit all "insane, idiotic, or otherwise permanently helpless children" to minors' pension, regardless of the date of the parent's death, or remarriage, at any period *prior to and including the age of twenty-one years*.

INCREASE OF THE BOARD.

The board, as authorized by recent act of Congress, has been increased to nine members; and the work is now being dispatched satisfactorily, under the more immediate supervision of the able Assistant Secretary.

CENSUS.

Organization and appointments.

The Secretary's last annual report set forth the history of the Eleventh Census to that date. The Census Office was already organized under the act of March 1, 1889 (25 Stat. U. S., p. 750), providing that a census of the population, wealth, and industry of the United States should be taken as of the date of June 1, 1890. The country was divided into one hundred and seventy-five supervisors' districts', and the organization of the office perfected.

These supervisors were subsequently selected. There was the utmost care to obtain persons the most suitable for the position. You demanded and received the approval, in each case, of both the Secretary and Superintendent, and had laid before you the recommendations of the applicant, which were from Senators, Representatives, or individuals well known. The selections were made from different political parties.

There was also great care in the selection of the 42,000 enumerators, the special agents, and experts. The clerks, numbering nearly 2,000, were examined according to rules established by the Secretary. A great many improved tabulating machines were employed, and every

preparation made to secure a prompt and accurate enumeration, and an early tabulation and announcement of the result.*

EXAMINATIONS.

The examinations of the force which was made under the statute and outside of the Civil Service Commission has been found sufficient to secure good clerks, and yet to be so pliable as to have enabled a rapid increase when required, as it will now allow a sudden decrease, without disappointing the just expectations of any of those engaged in this service. It has been also very gratifying to observe that those engaged in the Census Bureau have been most devoted to their work, and have on every occasion responded with cheerfulness to extra demands upon their time and energies.

ACT OF FEBRUARY 27, 1890.

The duties imposed upon the Superintendent were greatly increased by the act of February 27, 1890, entitled "An act to require the Superintendent of the Census to ascertain the number of people who own farms and homes and the amount of the mortgage indebtedness thereon."

The necessary questions to elicit this information were added to the population schedules. By replies to these questions, through special agents, records, and correspondence, the facts required will be accurately obtained.

PRINTING.

There were printed for the census work over 80,000,000 blanks, circulars, schedules, etc., about 75,000,000 of which were done at the Government Printing Office and the remainder at the Census Office itself. The Census Office printing-press has served an excellent purpose; but the Secretary can not express too highly his appreciation of the promptness, efficiency, and good-will exercised in this immense undertaking by the Public Printer (Mr. Palmer) and his assistants. They have, with unflagging footsteps, kept up with even the remarkable energy of the Superintendent of the Census, so that taking the census has not been retarded to any degree from delay in printing, which was one of the causes obstructing the completion of the Tenth Census.

* The methods pursued are set forth at length in the office report.

The following statement shows a praiseworthy stage of advancement of the present census:

Condition of work of Eleventh Census October 22, 1890, compared with work of Tenth Census at corresponding date.

No.	Division.	Condition of work under Eleventh Census October 22, 1890.	Condition of work under Tenth Census October 22, 1880.
1	Appointments*	Number of employes on Census Office roll, exclusive of special agents, 2,274.	Number of employes on Census Office roll, exclusive of special agents, 1,069.
2	Disbursements and accounts.†	Total expenditures on account of Eleventh Census to date, \$2,695,082.80. Sixteen thousand and sixty enumerators' accounts adjusted and passed to payment.	Total expenditures on account of Tenth Census to October 22, 1880, \$1,728,861.05. Number of enumerators paid, 20,899.
3	Geography	Supervisors' districts laid out; existing minor civil divisions determined for census purposes; areas of counties, etc., computed; records of rainfall and temperature revised and plotted on maps ready for final publication.	This work was not thus far advanced until a much later date in 1880.
4	Population	Count of population entirely completed and verified, and, with exception of three or four districts, has been announced through the newspapers, followed by substantially final announcement October 30, 1890. Special veteran schedules have been thoroughly examined and made ready for tabulation and verification. Work of tabulation of population schedules as regards color, sex, etc., about to be commenced.	First State announced in bulletin October 16, 1880. Population of United States announced January 15, 1881.
5	Vital statistics	Returns of 400,000 deaths (over one-third total number) examined, classified, and numbered ready for punching. Fourteen thousand physicians' registers returned and arranged by counties, etc. Forms of mortality tables all prepared. Seven hundred and twenty-five thousand death records in certain large cities copied and largely tabulated. All preliminary work completed.	Nothing done beyond general plans for securing returns. Enumerators' mortality schedules not turned over to this division until March, 1881. At least six months behind present condition.
6	Church statistics	Church statistics already collected to an extent not attained in any previous census.	
7	Educational statistics.	Twenty-one hundred and fifty candidates for appointment examined. School statistics well under way and much complete material ready for publication in a bulletin.	No record obtainable. No final report published.
8	Pauperism and crime.	Names of 185,000 inmates of institutions, jails, etc., received and work of tabulation commenced.	Nothing done. Final volume not published and but a few years old.
9	Wealth, debt, and taxation.	This inquiry nearly completed. One bulletin has been issued showing financial condition of counties, and bulletins are being prepared giving detailed financial statement as to 1,400 cities and towns.	Not nearly so far advanced.
10	National and State finances.	Indebtedness of foreign nations ascertained and compiled. Receipts and expenditures of United States for past ten years compiled. Statement of debt and finances of the States in preparation. Preliminary bulletin issued.	This work barely inaugurated at this date.
11	Farms, homes, and mortgages.	Transcripts of real estate records complete for 2,850 counties. Plan of work complete for investigation directed by special act of Congress.	This inquiry was not entered into in Tenth Census.
12	Agriculture	Preparatory work in progress.	Not commenced until December, 1880.

* This division has been discontinued.

† On account of increased number of inquiries more corrections of schedules were necessary, delaying payment.

Condition of work of Eleventh Census October 22, 1890, etc.—Continued.

No.	Division.	Condition of work under Eleventh Census October 22, 1890.	Condition of work under Tenth Census October 22, 1880.
13	Manufactures	Work well advanced. Bulletin of production of pig-iron issued; 220,000 returns from manufacturing establishments collected. Investigation relating to distilled spirits used in the arts completed. Report will be more complete than at any previous census.	Hardly two-thirds as much work had been done.
14	Mines and mining....	Work three-fourths completed. Field work finished. First results published August 8. Publication of final volume expected in summer of next.	First results published between six months and a year later than at present census. Final volume published in 1885.
15	Fish and fisheries	Fully one year in advance of work at corresponding date in Tenth Census.	Fully one year in advance of work at corresponding date in Tenth Census.
16	Transportation	Work well advanced. Some investigations nearly completed. Bulletin on rapid transit issued August 23.	Practically nothing had been done.
17	Insurance	Material almost all collected and ready for compilation.	Practically nothing done until later.
18	Printing and stationery.	Preliminary printing much more extensive and further advanced than in 1880. First bulletin printed February 10, 1890. Eleven have been published to date, and three more ready for printer.	First bulletin published October 10, 1880.
19	Statistics of special classes.	Enumerators being corresponded with for correction of special schedules.	At least three months behind present census.
20	Supervisors' correspondence.	Work of this division now practically completed.	No smaller division in Tenth Census.
21	Alaska	Special agents now in Alaska collecting statistics of population.	In similar condition.
22	Statistics of Indians..	Returns from 50 out of 80 agencies received. Special enumeration of Indians now being made.	
23	Social statistics of cities.	Eighty-five per cent. of special schedules received back complete. Tabulation in progress and bulletin almost ready.	At least eighteen months behind present census.

SUBJECTS OF INQUIRY.

The Superintendent's annual report presents in exhaustive detail all the different subjects besides population that will be embraced in the census, and the methods and means now being used to arrive at the very best results. These will, among others, include vital statistics, statistics of special classes, such as insane, deaf, blind, feeble-minded, and sick; social statistics of cities; education; church statistics; crime, pauperism, and benevolence; foreign, national, and State finances; local finance; statistics of farms, homes, and mortgages; agriculture, manufactures, mineral resources, transportation, fish and fisheries, insurance; Alaska, and Indians.

A reference to the Superintendent's report on these matters is deemed all that is necessary here. But the assurances made as to that most popular and useful portion of the census product—the maps and final volumes—it is thought well to quote at length:

PREPARATION OF THE FINAL VOLUMES.

Every effort has been made to prepare in advance such maps and tables showing the geographical distribution of the mean annual temperature and the mean annual

rain-fall over the United States as will be used in the final volumes. Many of these maps have been compiled and are now ready for the engravers.

Lists of counties have been prepared and districted in accordance with latitude, longitude, mean annual temperature, mean annual rain-fall, and drainage basins, in readiness for the distribution of the population by agricultural products and other data, as should be found necessary or desirable. The areas of the counties of the United States have also been measured by the geographical division of the Census Office for use in computing the density of population and other classes of data which depend upon area. The areas of drainage basins have also been measured. Also, for the division of morality, areas by wards and sanitary districts of cities have been measured and outlined. Maps of all large cities have been prepared, and are ready for the official returns. In this connection I wish to call attention to the necessity of securing for the Census Office the best engraving that can be done in this country. Some of the maps published in the volumes of the Tenth Census were regarded as models of workmanship and skill, competent European authorities declaring they were the best of the kind ever published in Government reports. On the other hand, there were some maps which appeared in the volumes of those reports which were alike discreditable to the reports and to the Government. In my opinion it is better to have no maps at all than to publish maps that are cheap, badly engraved, and misleading in every particular.

The first completed returns were received from the supervisors during the week ending June 14, and four days later the machine tabulation began. This great work has been prosecuted untiringly until the present time, and the substantial result can now be announced.

The following is that result, as stated by the Superintendent of Census, October 30, 1890.

Population of the United States in 1890 as compared with 1880 and 1870, by States and Territories, showing the increase by number and percentages from 1880 to 1890, from 1870 to 1890, and from 1860 to 1870.

[The figures for 1890 in this table are not final, but are subject to revision.]

States and Territories.	Population.			Increase from 1880 to 1890.		Increase from 1870 to 1890.		Increase from 1860 to 1870.	
	1890.	1880.	1870.	No.	Per cent.	No.	Per cent.	No.	Per cent.
The United States..	62,478,566	50,155,783	38,558,371	12,322,783	24.57	11,597,412	30.08	7,115,059	22.63
North Atlantic division	17,364,429	14,507,407	12,298,730	2,857,022	19.69	2,208,677	17.96	1,704,462	16.09
Maine	660,261	648,936	626,915	11,325	1.75	22,021	3.51	61,561	10.22
New Hampshire	375,827	346,901	318,300	28,836	8.31	28,691	9.01	67,773	21.34
Vermont	332,205	332,280	330,551	as1	0.02	1,735	0.52	15,433	4.90
Massachusetts	2,233,407	1,783,083	1,457,351	450,322	25.26	325,754	22.35	226,286	18.38
Rhode Island	345,348	276,531	217,353	68,812	24.88	59,178	27.24	42,738	24.47
Connecticut	745,861	622,700	537,454	123,161	19.78	85,246	15.86	77,307	16.80
New York	5,981,934	5,082,871	4,382,759	899,063	17.69	790,112	15.97	562,024	12.93
New Jersey	1,441,017	1,131,116	906,096	309,901	27.40	225,020	24.83	231,661	24.83
Pennsylvania	5,248,574	4,282,891	3,521,951	965,683	22.55	760,940	21.61	615,756	21.19
South Atlantic division	8,836,631	7,597,197	5,853,610	1,239,424	16.31	1,742,587	29.79	488,907	9.11
Delaware	167,871	116,608	125,015	21,263	14.50	21,593	17.27	12,709	11.41
Maryland	1,010,303	934,843	780,894	105,360	11.27	154,019	19.73	93,845	13.66
District of Columbia	229,796	177,624	131,700	52,172	29.37	45,924	24.87	56,620	43.11

a Decrease.

Population of the United States in 1890, as compared with 1880 and 1870, etc.—Cont'd.

States and Territories.	Population.			Increase from 1880 to 1890.		Increase from 1870 to 1890.		Increase from 1860 to 1890.	
	1890.	1880.	1870.	No.	Per cent.	No.	Per cent.	No.	Per cent.
South Atlantic division—Cont'd.									
Virginia.....	1,648,911	1,512,505	1,225,163	126,406	8.31	287,692	23.46	670,858	54.80
West Virginia.....	769,448	618,457	442,014	151,991	24.39	176,442	39.92	.....	.....
North Carolina.....	1,611,340	1,309,780	1,071,801	217,559	16.51	326,289	30.45	78,739	7.33
South Carolina.....	1,147,167	965,577	765,696	181,584	18.79	280,971	41.10	1,898	0.27
Georgia.....	1,834,260	1,612,180	1,184,149	222,080	13.75	318,071	26.24	120,823	12.00
Florida.....	659,435	269,437	187,748	129,942	44.48	81,743	43.54	47,324	25.70
Northern Central division.	22,320,205	17,561,112	12,581,114	4,759,093	27.24	4,183,069	33.70	2,884,985	42.70
Ohio.....	3,688,719	3,158,002	2,603,296	468,637	14.85	522,892	19.69	923,749	13.42
Indiana.....	2,289,030	1,978,801	1,680,637	210,229	10.65	297,664	17.71	339,269	24.46
Illinois.....	3,818,536	3,077,871	2,589,891	740,665	24.06	637,980	21.18	827,940	49.36
Michigan.....	2,669,792	1,639,927	1,181,059	452,853	27.66	492,877	41.29	434,946	36.66
Wisconsin.....	1,685,497	1,315,497	1,054,070	268,290	20.39	296,827	24.73	278,789	26.43
Minnesota.....	1,500,017	789,773	439,706	510,314	64.56	341,097	77.37	267,683	155.61
Iowa.....	1,906,720	1,624,615	1,191,020	282,115	17.26	430,595	36.06	318,107	26.31
Missouri.....	2,678,234	2,168,880	1,721,235	506,854	23.37	447,085	25.97	539,283	45.97
North Dakota.....	183,425	135,177	14,180	145,590	104.26	129,990	633.23	9,244	193.16
South Dakota.....	327,848	.....	.....	279,880	233.63	.....	.....	.....	.....
Nebraska.....	1,056,793	452,402	172,902	604,391	133.60	329,480	267.83	94,152	126.43
Kansas.....	1,429,485	896,000	561,999	477,289	42.31	631,097	173.35	267,103	199.91
Southern Central division.	10,945,253	8,919,371	6,454,410	2,928,882	32.75	2,484,961	38.62	663,787	11.54
Kentucky.....	1,859,439	1,614,699	1,321,011	266,740	16.54	327,679	24.81	185,857	14.31
Tennessee.....	1,765,723	1,542,959	1,258,920	291,864	18.35	285,839	22.55	146,719	13.49
Alabama.....	1,568,073	1,263,565	960,092	315,508	19.45	263,513	26.63	32,791	3.40
Mississippi.....	1,284,887	1,131,597	827,922	153,290	13.55	303,675	36.69	36,617	4.43
Louisiana.....	1,116,828	939,946	729,915	176,882	18.82	213,031	29.31	18,913	2.67
Texas.....	2,282,220	1,591,749	818,679	690,471	43.74	779,170	94.45	214,268	25.48
Indian Territory (b).									
Oklahoma.....	661,701	.....	.....	61,701	.....	.....	.....	.....	.....
Arkansas.....	1,125,385	802,525	494,471	322,860	40.23	318,054	64.05	49,811	11.26
Western division..	2,008,948	1,767,607	900,540	1,241,251	70.22	777,187	78.46	371,534	40.40
Montana.....	181,760	39,189	29,595	92,609	236.50	18,094	60.14	29,495	.....
Wyoming.....	69,549	20,789	9,118	39,899	211.45	11,674	124.00	9,118	.....
Colorado.....	410,975	194,257	39,890	216,648	111.48	164,469	387.47	6,587	16.20
New Mexico.....	144,862	119,565	91,874	25,295	21.16	27,601	29.14	31,642	31.78
Arizona.....	59,631	40,440	9,658	19,243	47.60	30,782	318.72	9,658	.....
Utah.....	206,498	143,903	86,786	62,595	43.41	57,177	65.98	46,512	115.49
Nevada.....	44,327	62,206	42,400	117,926	28.61	10,775	46.34	26,634	519.07
Idaho.....	84,229	32,619	14,939	51,619	158.79	17,611	117.41	14,939	.....
Alaska (c).....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington.....	849,516	75,116	23,655	274,400	368.20	51,161	211.57	12,345	166.62
Oregon.....	312,430	174,708	99,925	137,722	78.80	62,845	62.72	39,416	73.36
California.....	1,594,692	854,694	509,247	939,908	99.74	901,417	54.34	199,259	47.44

a Of Virginia and West Virginia together.

b The number of white persons in the Indian Territory is not included in this table, as the census of Indians and other persons on Indian reservations, which was made a subject of special investigation by law, has not yet been completed.

c Including Greer County (Indian Territory), claimed by Texas.

d Decrease.

e The number of white persons in Alaska is not included in this table, as the census of Alaska, which was made a subject of special investigation by law of Congress, has not yet been completed.

Population of the United States in 1890, as compared with 1880 and 1870, etc.—Cont'd.

RECAPITULATION BY GROUPS.

Geographical divisions.	Population.			Increase from 1880 to 1890.		Increase from 1870 to 1880.		Increase from 1860 to 1870.	
	1890.	1880.	1870.	No.	Per cent.	No.	Per cent.	No.	Per cent.
The United States.	62,478,566	50,155,783	38,558,371	12,322,783	24.57	11,507,412	30.08	7,115,050	22.63
North Atlantic division.	17,364,429	14,507,407	12,298,730	2,857,022	19.69	2,208,677	17.96	1,704,462	16.09
South Atlantic division.	8,836,631	7,597,197	6,853,610	1,239,434	16.31	1,743,587	29.79	488,907	9.11
Northern Central division.....	22,320,805	17,364,111	12,961,111	4,956,194	28.54	4,383,000	33.76	3,884,395	42.70
Southern Central division.....	10,948,253	8,919,371	6,434,410	2,028,882	22.75	2,484,961	38.62	665,762	11.54
Western division.....	3,008,948	1,767,697	990,510	1,241,251	70.22	777,187	78.46	371,534	60.02

The following table shows the relative rank in population of the States and Territories in 1890 and in 1880:

Relative rank of States and Territories in population.

1890.	1880.	1890.	1880.
1 New York.	1 New York.	26 Nebraska.	26 Minnesota.
2 Pennsylvania.	2 Pennsylvania.	27 Maryland.	27 Maine.
3 Illinois.	3 Ohio.	28 West Virginia.	28 Connecticut.
4 Ohio.	4 Illinois.	29 Connecticut.	29 West Virginia.
5 Missouri.	5 Missouri.	30 Maine.	30 Nebraska.
6 Massachusetts.	6 Indiana.	31 Colorado.	31 New Hampshire.
7 Texas.	7 Massachusetts.	32 Florida.	32 Vermont.
8 Indiana.	8 Kentucky.	33 New Hampshire.	33 Rhode Island.
9 Michigan.	9 Michigan.	34 Washington.	34 Florida.
10 Iowa.	10 Iowa.	35 Rhode Island.	35 Colorado.
11 Kentucky.	11 Texas.	36 Vermont.	36 District of Columbia.
12 Georgia.	12 Tennessee.	37 South Dakota.	37 Oregon.
13 Tennessee.	13 Georgia.	38 Oregon.	38 Delaware.
14 Wisconsin.	14 Virginia.	39 District of Columbia.	39 Utah.
15 Virginia.	15 North Carolina.	40 Utah.	40 Dakota.
16 North Carolina.	16 Wisconsin.	41 North Dakota.	41 New Mexico.
17 Alabama.	17 Alabama.	42 Delaware.	42 Washington.
18 New Jersey.	18 Mississipp.	43 New Mexico.	43 Nevada.
19 Kansas.	19 New Jersey.	44 Montana.	44 Arizona.
20 Minnesota.	20 Kansas.	45 Idaho.	45 Montana.
21 Mississipp.	21 South Carolina.	46 Oklahoma.	46 Idaho.
22 California.	22 Louisiana.	47 Wyoming.	47 Wyoming.
23 South Carolina.	23 Maryland.	48 Arizona.	
24 Arkansas.	24 California.	49 Nevada.	
25 Louisiana.	25 Arkansas.		

It will be seen that, as in 1880, New York still heads the list and is followed by Pennsylvania. Ohio and Illinois have exchanged places. Of the other changes in the list the most marked are those of Texas, which rises from No. 11 to No. 7; Kentucky, which drops from 8 to 11; Min-

nesota, which rises from 26 to 29; Nebraska, which rises from 30 to 26; Maryland, which drops from 23 to 27; Colorado, which rises from 35 to 31; Vermont, which drops from 32 to 36; Washington, which rises from 42 to 34; Delaware, which drops from 38 to 42; Nevada, which drops from 43 to 49; and Arizona, which drops from 44 to 48. The average change in rank is 2.2 places.

The complete table will differ at most only a few hundreds from the foregoing.

COMMENTS ON ENUMERATION OF POPULATION.

In a report dated October 28, 1890, made upon the substantial completion of the enumeration, the Superintendent presents a very full explanation of its validity, showing the unfairness of any comparison between the percentage of increase between 1870 and 1880 and that between 1880 and 1890. The discussion contained in the Superintendent's paper cannot be fairly abbreviated and it is appended in full. [Appendix C.]

There have been some contests, and in some instances corrections have been made on applications for reenumeration. But 80 per cent. of all the complaints against the Eleventh Census, and there were only about the same number as against the Tenth Census, have on careful investigation been found groundless.

OPPOSITION TO THE WORK.

It is a noteworthy fact that upon the promulgation of the questions to be answered for the purposes of the census, some relating to disease and other of the subjects above mentioned, a great number of editors throughout the country began a bitter attack upon the whole census system and used every means of argument and invective to array the people against replying to the inquiries of the enumerators, and even denounced the whole work in advance. But the people recognized the census as a national work, meant not only for the necessities of our own Government, but for the benefit of all men, and the questions, including those relating to farms, homes, and mortgages, were almost universally and promptly answered.

This census will, it is believed, be found to be reliable. To say that there are no errors in it would be to claim for it more than can be expected of any such work. But those who find the most fault with it are those who from the beginning have endeavored to defeat it. The great body of our people are content with it.

The disputes that have arisen as to certain cities, and even one State, have been patiently heard where it was asked, and opinions given at length setting forth the reasons for the action taken. Time alone can now test the Eleventh Census, exposing errors, if any exist, and confirming its substantial accuracy. The work has certainly been most carefully prepared, and as the result goes to the country, the Secretary feels that the duty imposed upon the Census Office has been faithfully performed.

GEOLOGICAL SURVEY.

As shown in the report of the Director of the Geological Survey, the important industries and interests growing out of the mineral resources of the country are steadily increasing in prominence, the increase in mineral productions in the United States from 1888 to 1889 being in round numbers \$40,000,000.

During the fiscal year the operations of the Geological Survey have been so extended as to cover several new mining interests. A systematic study of the zinc mines and ores of Missouri has been undertaken and pushed rapidly. A study of the geology and chemistry of the phosphate deposits of Florida was commenced, a geological reconnaissance was carried over a considerable part of the State, and a topographic survey was instituted with the object of constructing large scale maps upon which the distribution of the phosphate bearing rocks and associated strata may be represented. A detailed survey of the Narragansett coal basin of Massachusetts was commenced and satisfactory progress made. Meantime the study of mineral resources conducted during previous years was not relaxed; work has been carried forward in the study of the gold belt of California, in the surveys of coal fields and other mineral bodies in Colorado by one division of the Survey and in Montana by another; and the Lake Superior iron region has been the theater of continued explorations and the subject of publication. Detailed topographic surveys for geologic purposes have been made in the anthracite region of Pennsylvania, and the study of the coal, oil, and gas bearing portions of West Virginia has been pushed to such a stage of completion that a report thereon has been prepared for the press. The researches in the region of rapid mineral formations in and about the Yellowstone National Park has also been continued; and the subject of rock gas and its distribution has received renewed attention. Several geologic parties have been employed during the year in laying down upon maps designed for early publication the areal distribution of the rock formations.

As during previous years the Director of the Geological Survey has not confined attention to those resources of the earth already known and adequately appreciated by prospectors, investigators, and other persons, but has sought to extend the science of geology with the view of developing new resources and thereby promoting the progress of the country and the welfare of the people.

Accordingly, new principles are developed as the facts of observation are gathered, the field of the survey is widened and its operations are gradually extending to the various natural resources of the earth—to soils as well as minerals, to the springs, streams, and rivers of the surface as well as to subterranean waters, to the inundated lands of the coast as well as to mountain sides, to new combinations of mineral substances for industrial purposes, as well as to new minerals.

During the year the topographic surveys made for geologic purposes have been carried on in twenty of the States, and an area of 46,807 square miles has been surveyed and mapped on two scales of about 1 mile to the inch and about 2 miles to the inch, respectively.

During the year the Geological Survey has had published one annual report in royal octavo, two quarto monographs, ten octavo bulletins, and an octavo report upon the mineral resources of the United States. It has sent out an aggregate of 46,847 volumes, of which 15,019 have been exchanged, 2,931 sold, and 28,897 distributed gratuitously. The acquisitions of the library during the year by purchase and exchange number 3,212 books and 3,857 pamphlets.

Two changes in the organization of the Geological Survey have been authorized. When the functions of the Geological Survey were enlarged by laws enacted March 20, 1888, October 2, of the same year, and March 3, 1889, the labor devolved upon the Director became arduous, and he requested authority for combining the various geologic divisions of the Survey in a geologic branch and for appointing a chief geologist in charge of that branch. Authority for the change was conferred, and upon the recommendation of the director Mr. G. K. Gilbert was appointed chief geologist. Another change in organization which grew out of a legal provision for the engraving of the atlas sheets of the topographic and geologic surveys of the United States was the institution of a division of engraving and the appointment of a chief engraver with the necessary assistants. The engraving done in the Survey is for experimental purposes, the chief part of the work being done by contract.

The report of the Director of the Survey is accompanied by two scientific papers, the first relating to the unconsolidated deposits overlying the rocks of a territory of 16,500 square miles in Iowa, and the second relating to the rock gas and petroleum of the great Indiana gas-field, the largest known in the world.

Questions in regard to the arid lands and the selection of water reservoirs for purposes of irrigation have been discussed in this report in connection with the business of the Land Office. This subject, with others of general interest, will be treated of in the annual report to be made to Congress by the Director, under the supervision of the Secretary of the Interior.

During the recent earnest inquiry into the best system to be adopted for irrigation and the discovery that the statute of October 2, 1888, had reserved vast districts of land from entry, there was displayed some disposition to criticise the methods and purposes of this Bureau. But it is believed to have stood the ordeal well, and to have preserved the public confidence it so well deserves. In the judgment of the Secretary, it is accomplishing a vast and most valuable work in the best manner.

BUREAU OF RAILROADS.

The report of the Commissioner of Railroads, and the accompanying report of the railroad engineer of his office, contain full information in regard to the condition of the several railroad companies coming under the jurisdiction of his office, their roads, accounts, and affairs, for the fiscal year ending June 30, 1889.

At the time of making his report for the year ending June 30, 1889, the Commissioner had been unable to obtain statements showing the condition of several of the land-grant roads. A number of the companies, whose grants of lands had been received through the medium of the States in which their lines are located, held that, therefore, they did not come within the provisions of the act of June 19, 1878, creating the Railroad Bureau and defining its powers. The point raised was that a grant to a State to aid in the construction of a railroad was not a grant to the railroad. The matter was submitted to the Secretary and referred for opinion to the Assistant Attorney-General assigned to this Department. This officer held that in order "to bring it [the company] within the provisions of the act, it is sufficient that it has received the benefits of a grant as the owner of all rights and privileges of any road upon which such grant has been conferred, either by the Government directly or by the State to whom the grant was originally made." This opinion was approved and the Commissioner was directed to act upon it officially. He states that the several railroad companies were promptly notified of this ruling and requested to make reports as required by law, and that, with one or two exceptions, they have complied with the request.

IMPROVEMENTS ON BONDED ROADS.

The Commissioner, in company with the engineer of his Bureau, has traveled over nearly all the bonded roads and many of the Pacific land-grant lines, and says:

I am able to report that many improvements, such as replacing iron rails with steel, putting in stone and iron culverts and bridges in place of wooden ones, reducing grades, ballasting, enlarging machine-shops, building new station-houses, adding to terminal facilities, increasing rolling-stock, etc., have recently been and are continually being made. These improvements, where they are made upon the bonded roads, are of especial value to the Government, as they not only increase the earning capacity of the roads and thereby the amount of net earnings to be paid in liquidation of the Government debt, but they add largely to the value of the property and so increase the Government security and render full final payment of the claims of the United States more certain.

The amount received from the bonded roads this year was slightly below the receipts for the preceding year. This is not owing, however, to a decrease in business, but to the fact of unusual expenditures by the Union Pacific Railway Company in the purchase of rolling-stock,

As to the present financial relations between the bonded roads and the Government, the same unfortunate condition of things exists now that has always existed since the bonds granted in aid of their construction were issued, viz, that the amounts annually received from the roads fall largely below the amounts of interest annually accruing upon the subsidy bonds. The debts therefore due the Government from these roads, instead of being reduced, as it was the evident expectation of Congress that they would be, are rapidly increasing year by year. The per cent. of net earnings required by law to be paid in discharge of the Government obligations is not great enough to meet the interest which annually accrues upon the bonds issued to aid in the construction of the roads.

The most conspicuous cause of reduction in the net earnings of the bonded roads is the building of numerous competing lines and the consequent reduction in both the volume and rates of traffic. In many sections west of the Mississippi River and on the Pacific Slope the mileage of railroads is greatly in excess of the legitimate needs of the carrying trade. The last few years have seen an excess of railroad building in the West, and many investments in railroad properties have failed to yield even the smallest dividends. But this condition of things probably will not long exist. Roads that now run for long distances through sparsely settled sections, depending almost wholly upon through traffic, will soon find thrifty settlements all along their lines, yielding a large and profitable local trade. The country will catch up with the railroads. Then the transportation business will be on a safe and paying basis, the speculative period of railroad construction will be ended, and the operations of traffic found to be increasing and profitable. When that time arrives, and its approach is certain and not far distant, the bonded roads will show, as they ought to show, statements of largely increased net earnings which will enable them to meet within a reasonable period their obligations to the Government, and yield a fair return upon the investments of their stockholders.

FUNDING THE DEBTS.

The Commissioner adheres to the opinion given in his last report, that it will be necessary to extend the time in which the railroads may meet their obligations to the Government. He gives the history of the pending legislation and states that the question of time is of little importance as compared with that of security in the adjustment of the subsidy debts. He believes that it would be a great calamity should the Government be compelled to acquire the ownership and engage in operating the railroads. He makes the suggestion, which seems to be a wise one, that in no event should the Government be a loser by granting the extension, and that no funding bill should be considered that

does not provide for a rate of interest at least equal to that which the Government is required to pay upon its obligations.

The principal and interest of the subsidy bonds do not become due until 1897. The Commissioner believes that the roads will be in a better condition to settle then than now, and the Government will not suffer by delay so long as the value of the property on which it holds liens is being steadily increased by the addition of valuable improvements.

This subject was fully discussed by the present Secretary in his last annual report, and the views then expressed are still retained and are still applicable, as no legislation has yet been completed on this very important subject.

SIoux CITY AND PACIFIC.

A bill is pending in Congress, having already passed the Senate, authorizing the Secretary of the Treasury, by and with the consent of the President, to settle the indebtedness of this company to the United States upon such terms as shall, in the judgment of the Secretary, approved by the President, be for the best interests of the Government. It is apparent, from the figures given by the Commissioner as to the condition of this company, that it will never be able to pay in full its Government debt. The report of the Commissioner shows in detail the operations of the road and its financial condition.

UNION PACIFIC GUARANTEES.

Certain criticisms, allegations, and complaints have come to this Department through the public press, and in communications, both oral and written, from individuals, touching the management of the Union Pacific Railway Company in the matter of guaranteeing the bonds and stocks of other railway corporations whose lines are operated in connection with the Union Pacific system. It has been urged that these guaranties were made in violation of law, and that they would have the effect, and were made with the purpose, of defrauding the Government.

On July 3, last, the following resolution was adopted by the United States Senate:

Resolved, That the Secretary of the Interior be directed to inform the Senate whether he has knowledge of the guaranty, actual or proposed, by the Union Pacific Railway Company, of the bonds or stock of any other corporation, more especially those of the Oregon Railway and Navigation Company, and of the Denver and South Park Railroad Company. Whether said Union Pacific Railroad Company has paid out of its surplus earnings or otherwise the indebtedness, or any part thereof, of said or other companies, and if so, whether such guaranty or such payment, or both, are in accordance with law and consistent with the obligations of said Union Pacific Railroad Company to the United States; and that the Secretary of the Interior be directed to communicate to the Senate all information in possession of his Department on the subject.

The resolution was referred to the Commissioner of Railroads for report; in response was given a complete list of the companies whose

bonds or stocks, or both, had been guarantied by the Union Pacific Railway Company, together with a statement of the manner, form, and amounts specified under the name of each corporation. The Commissioner further stated, in his report on the resolution, that no part of the earnings of the Union Pacific Railway Company which are required under the law to be paid to the Government, have been used for any other purpose than in liquidation of the Government debt.

The inquiries of the Senate were fully answered and the opinion of the Assistant Attorney-General for this Department given, in which the Secretary concurred, that on the facts as shown by the Commissioner, there has been no violation of the United States Statutes by the company in these matters, nor of its obligations to the Government.

REPORT OF GOVERNMENT DIRECTORS.

In connection with the Commissioner's report it is deemed the statements of the Government Directors will prove of value. In this the following facts appear:

The increase of gross earnings of the first six months of 1890 over the same period in 1889 is \$3,295,027.53. However, the Oregon Railway and Navigation Company and the Denver, Texas and Fort Worth Railroad system included in the 1890 statement are not included in that for 1889.

The surplus earnings of all lines operated by the Union Pacific Company for the first half of the year were \$6,051,434.71 as against \$5,829,385.82 for the same period of 1889.

The number of miles operated for said six months of this year was 8,034.46 and the expense of operation \$14,664,500.39, taxes not included, as against 7,819.40 miles and \$11,591,521.75 for the same half of 1889.

The Oregon Short Line and Utah Northern Railway show increased earnings, but the surplus earnings are reduced from \$1,294,450.88 for the six months ending June 30, 1889, to \$1,129,928.05 for the same period of this year.

The Oregon Railway and Navigation Company shows a reduction of gross earnings, attributed to short crops in Oregon and Washington, from \$1,866,364.76 for the earlier period to \$1,866,364.76 for the latter, while the increase of operating expenses was \$427,534.90.

During the year 1889 the surplus revenue from all sources was \$2,402,440.57.

The total debt of the Union Pacific to the Government January 1, 1890, was \$50,902,765.92. This falls due in the years 1895-1899.

The rapid settlement of the States and Territories tributary to the Union Pacific road and its connections with the great development of agricultural and mining interests calls for large and continuous expenditure in the matter of improvements, extensions, and connections to meet the growing demands of population and business.

The company has pursued a wise course in meeting these demands

as rapidly as its means would permit. Important extensions are now under way, steel rails are being substituted for iron, and iron bridges for wooden.

The extensions to Tacoma and Seattle will give access to the Puget Sound trade, while the extension from Milford to Pioche and from Wendover to Douglas and other improvements call for large outlays.

The shops at Cheyenne upon which \$223,675.73 were spent in 1889 still demand expenditure.

The work of developing coal mines of great value to the company cost \$341,000 in 1889, and \$222,000 was spent on the Carbon Cut-off, destined to form a loop of 55 miles between Sulphur Springs and Rawlins.

On account of the need of expenditures on these and other pressing improvements it has been deemed expedient to postpone the establishment of the second sinking fund proposed a year ago.

A speedy and equitable settlement of the indebtedness to the Government is urged. The debt can not be met as due without the suspension of improvements and consequent injustice to the population dependent on the road and its continued extensions. The work ahead of the company, if faithfully performed, means large expenditures and small profits for years to come.

The best interests of the people of the Great West should be considered paramount to all others in the settlement of the question.

The present management of the company the directors report as honest and wise, and they think the Frye bill now before the Senate should be adopted. In return for an extension of time and a lower rate of interest, it is stated the company would give a mortgage on the whole property, thus increasing the Government security in the sum of \$34,500,000. This would put an end to a quasi-partnership in the management, leave the company free to conduct its business without interference, and make the Government an ordinary creditor.

During the past year the company entered into arrangements with the Chicago and North-Western by which it can send its freight to Milwaukee, St. Paul, and other points on the latter road without breaking bulk.

During 1889 the Colorado Central Railroad Company, of Colorado, the Colorado Central Railroad Company of Wyoming; the Georgetown, Breckenridge and Leadville Railroad Company; the Denver and Middle Park Railroad Company; the Denver, Marshall and Leadville Railroad Company; the Greeley, Salt Lake and Pacific Railway Company, and the Cheyenne and Northern Railway Company were consolidated into one company, known as the Union Pacific, Denver and Fort Worth Railway Company. Also a further consolidation between the company as named above and the Denver, Texas and Fort Worth Railroad Company, looking to the large traffic centered at Pueblo.

During 1889 the Union Pacific Road secured undisputed possession of

the Oregon Railway and Navigation Company, by securing a majority of the stock of that company.

The following table exhibits the amount of precious metals yielded in 1889 by several States and Territories whose trade is tributary to the Union Pacific Road and its branches:

States and Territories.	Gold.	Silver.	Total.
Colorado.....	\$3,636,217.38	\$28,359,957.94	\$32,996,175.32
South Dakota.....	2,912,625.00	160,663.00	3,073,288.00
Oregon.....	1,352,249.37	41,580.00	1,393,829.37
Washington.....	193,709.00	166,000.00	359,709.00
Utah.....	429,800.00	6,659,254.65	7,089,054.65
Idaho.....	2,054,708.00	4,440,347.00	6,495,055.00
Montana.....	3,794,009.82	20,038,871.25	23,832,881.07
Total.....	14,444,919.97	38,092,782.81	52,537,702.78

In addition to this Colorado produced, lead, \$5,168,679.32, and copper, \$363,983.01; and Utah, lead, \$1,468,246.65, copper, \$206,679.20.

There were received over the Union Pacific and its branches, during 1889, ores as follows:

	Tons.
Idaho.....	9,731,023
Montana.....	1,352,256
Utah.....	29,064,684
Oregon.....	282,612
Various points in Colorado.....	187,535,776

LEGISLATION NEEDED.

The Commissioner of Railroads renews his recommendation that an act amending the law creating the Railroad Bureau be passed, requiring the bonded roads to transmit to his office duplicates of all accounts for transportation services rendered the Government, including the carrying of the mails; and that all disallowances and differences in said accounts, found by the accounting officers upon settlement, be reported to the Commissioner of Railroads, to the end that the records of his office may at all times give easy access to any information that may be desired by Congress, or any of the Departments of the Government, in regard to the accounts and indebtedness of any of the bonded roads.

In the last annual report the Secretary strongly indorsed this recommendation. A bill, providing for the amendment suggested, was unanimously passed by the Senate at its late session, and is now pending in the House of Representatives, and it is earnestly recommended that it receive the favorable consideration of that body.

The financial condition and operations of the roads which have received land grants only, and which come under the jurisdiction of this Department, but in which the Government has no direct pecuniary interest, appear in such detail in the report of the Commissioner that it

is deemed unnecessary to repeat them here, further than presented in the Government Director's report as to the Union Pacific, an analysis whereof is set forth above.

BUREAU OF EDUCATION.

The Commissioner of Education makes a very suggestive report on the work done, and to be done, by his Bureau. Its object, as he states, is to collect and distribute information showing the present status of education in the United States, and also the educational progress of other nations. He goes on to say that inasmuch as all supervision has for its first object the increase of enlightened directive power, the function of this Bureau is an important one, for through a knowledge of whatever has proved of value in the entire field of education the greatest progress is made at the smallest cost, each person profiting by the experience of all.

In proof of the extending interest in the work of the Bureau, the Commissioner gives a table showing an increase of letters received over the previous year of nearly 29 per cent., and an increase of letters sent out of 47 per cent. The number of documents sent out the past year, 182,215, slightly exceeds the number of the previous year.

The Bureau has made during the year ten publications on subjects directly connected with education in the different States. The series of American Educational History, projected by the previous Commissioner, Hon. N. H. R. Dawson, reflects great credit on his sagacity, and deserves special mention. By economizing other expenditures from appropriations for the collection of statistics and the distribution of documents, he succeeded in setting apart sufficient money to engage competent persons, working under the supervision of Professor H. B. Adams, of Johns Hopkins University, for the preparation of all the volumes required to give a history of higher education in every State of the Union.

The Commissioner, who certainly ought to know, states that national education does not begin, as is sometimes supposed, with primary education, but with higher education. The first education was that of the princes and the clergy; but the diffusion of the democratic ideas contained in Christianity made and still continues to make education a gift to all men. The history of higher education in the several States affords the needed clew to the beginning of our present widely extended system of common schools. The publication of that history by this Bureau is said to be having an excellent practical effect, for it is doing much to secure the necessary co-operation of the large body of highly cultured and influential men who guide education through colleges and universities.

There has also been noticed, especially in the South, the appearance of an increased interest in educational history, and the Commissioner reports that there has never before been so much spirit of co-operation with this Bureau as now.

REPORT ON FINE AND INDUSTRIAL ART.

Attention is called by the Commissioner to the second volume of the Special Report upon American Education in Fine and Industrial Art, by I. Edwards Clarke, an important work, not only because of the care displayed in its preparation, but because of the vital interest given to the question of art education by American industries. Without training in taste, says the Commissioner, our workmen can not produce such qualities of ornament as will admit our goods into the markets of the world; our surplus wealth will be expended in importing high-priced goods that can not be manufactured here because of this lack of training in the world's standard of the beautiful.

PRINTING FUNDS OF BUREAU OF EDUCATION.

The Commissioner hopes that the work accomplished will emphasize the request for a more liberal allowance of money for the printing fund of this Bureau. He repeats that the Bureau is not established to exercise a centralized control in the management of educational institutions, but solely to increase local self-direction by collecting and digesting for it the records of educational experience throughout the world, and thereby contributing to its enlightenment. The Bureau's entire usefulness, therefore, depends directly on what it prints and publishes. It must diffuse its information among the teachers of the land, or else it does not accomplish its function. And to attain its highest degree of usefulness and make available the material which it collects and prepares from year to year, it should have at least double the sum for printing that it now has.

Moreover, the system of throwing back into the Treasury money unused at the end of the fiscal year works much injury to the Bureau. Work already ordered or contracted for remains unfinished, or not begun, and, upon completion, is charged against the fund for the next year. During the years from 1886 to 1889 the aggregate amount allotted to this Bureau was \$58,194.94, and the amount expended was \$42,229.38, leaving a balance unexpended of \$15,965.56, the Bureau's claim to which was canceled. This is greatly deprecated both by the former and the present Commissioner, and, in the Secretary's opinion, with justice. He is satisfied that the system is a mistake and should be rectified. If the sum due, of nearly \$16,000, was put to the credit of the Bureau the Higher Education series could be promptly forwarded, and monographs now waiting publication could be circulated. Whatever appropriation for this purpose is made should be allowed to continue from year to year until expended.

THE LIBRARY AND MUSEUM DIVISION.

The Commissioner states that during the past year the library has received nearly 5,000 volumes and more than 10,000 pamphlets, making the total number of volumes in the library 38,000, and 100,000 pamphlets.

He hopes to print the coming year a complete index to all volumes relating to education and an analytical index to some of the more important sources of educational information, such as Henry Barnard's exhaustive *American Journal of Education*, which the Commissioner states contains more educational literature of the first-class order than any other work in any language.

PUBLIC-SCHOOL STATISTICS.

The division of statistics shows that there are enrolled in the public schools of the United States 12,291,259 pupils, or 19.7 per cent. of the total population. The increase during one year has been 220,903, or at the rate of 1.83 per cent. per annum. This, however, has not equaled the rate of growth of the school population, which has been 2.17 per cent. per annum.

The progressive decrease in the number of public-school pupils as compared with the population in the Northern States, which has already been referred to in the reports of this office, is still going on; in point of fact, there has been during the past year an *absolute* decrease in the number of pupils enrolled in six of the Northern States, and in one other—New York—there has been an increase of only 514 pupils against an increase of school population of over 30,000. The following figures will serve to briefly show the change in the percentage of population enrolled as public-school pupils since 1870:

Percentage enrolled.

	1870.	1880.	1890.
The United States.....	17.8	19.7	19.7
North Atlantic Division.....	22.1	24.2	18.3
South Atlantic Division.....	6.2	16.4	18.7
North Central Division.....	21.4	23.2	22.8
South Central Division.....	7.5	15.4	17.7
Western Division.....	13.8	16.6	16.5

These figures may require some slight correction when the complete returns have been received. The Commissioner calls attention to the fact that the proportion of the total population enrolled is greater in the South Atlantic than in the North Atlantic States. With the proportion of school population, however, the reverse is the case: for every 100 *children of school age* there are 108 pupils enrolled in the North Atlantic States and only 88 in the South Atlantic. This difference arises from the excess of children of school age in the South.

In the Commissioner's opinion the apparent retrograde movement in the Northern States may be partially accounted for by the increase of private and parochial schools and by the tendency to refrain from sending children to school at as early an age as heretofore, whereby the

number of very young pupils has diminished. In Massachusetts, for instance, the number of pupils under five years of age has decreased during each of the last ten years.

The growth of the public school system of the South is a remarkable phenomenon, which is clearly exhibited in the figures quoted above. It must be noted, however, that many of the existing public schools of that section were in operation in 1870 as private schools.

AVERAGE DAILY ATTENDANCE.

The average number of pupils daily attending the public schools is 65.1 per cent. of the whole number enrolled. This percentage was 59.3 in 1870 and 62.3 in 1880, thus showing a steady growth.

The falling off of enrollment in the Northern States since 1870 has been nearly counterbalanced by the increased regularity of attendance of those who are enrolled, so that about as large a proportion of the population attend school daily as in 1870.

TEACHERS.

The number of different public school teachers is as follows: Males, 124,929; females, 227,302; total, 352,231.

The male teachers comprise 35.5 per cent., or somewhat more than one-third of the whole. The relative number of male teachers has been continually decreasing since 1879, at which date they formed 43.3 per cent. of the whole. This decrease is taking place in all parts of the country. The present percentage in Massachusetts is only 8.9.

The average wages of male teachers per month in 36 States and Territories is \$42.43, being a decrease of 4 cents; of female teachers \$34.27, an increase of 32 cents.

SCHOOL REVENUES.

The public school revenues amounted to \$132,121,200. Of this sum \$9,743,994, or 7.4 per cent. of the whole, formed the income on permanent invested funds; \$25,379,390, or 19.2 per cent. of the whole, were derived from State taxes; and \$88,328,385, or 66.8 per cent. of the whole, from local taxes; \$8,660,431, or 6.6 per cent. of the whole, were derived from sources not included in the foregoing.

SCHOOL EXPENDITURES.

The total amount expended the past year for public school purposes was \$132,129,600, being an increase over the preceding year of \$8,861,660, or at the rate of 7.19 per cent. per annum.

The amount expended for all purposes per capita of the population was \$2.12, of which \$1.41 was for salaries. To educate a child in the United States costs at present an average of 13.3 cents per school day, of which 8.2 is paid for salaries of teachers and superintendents.

The rate of growth of school expenditure (7.19 per cent. per annum), when compared with the rate of growth of the number of pupils enrolled

(1.83 per cent.), is seen to be extraordinary, and indicates a rapidly growing per capita expenditure. The total school expenditure per capita of population at different periods is as follows:

Expended per capita of population.

	1870.	1880.	1889.
The United States	\$1.64	\$1.56	\$2.12
North Atlantic division	2.31	1.97	2.67
South Atlantic division .....	.47	.67	.93
South Central division .....	.48	.55	.84
North Central division	2.09	2.03	2.77
Western division	2.02	2.41	3.22

In the Northern States a period of maximum per capita expenditure occurred about 1875. From that time on until about 1880 a considerable decrease took place. After 1880 a rise came again, which has been going on until the present time. The present expenditure is considerably in excess of any that has preceded it.

The decline in the per capita expenditure in the Northern States from 1875 to 1880 may be attributed to a reaction which followed upon the "flush" times succeeding the war. A period of liberal expenditure was succeeded by a period of retrenchment and economy. There was also a shrinkage of values taking place, so that the same tax-rate would produce from year to year a smaller revenue. In three years during this period the property valuation of Massachusetts fell off nearly \$240,000,000.

The Southern States, as well as the Northern, form a characteristic group in the matter of school expenditure, of which the distinguishing feature is the small amount expended per capita as compared with the North. During the decade 1870-'80 there were many fluctuations in school expenditure in the South; this period was a formative one, during which school affairs were unsettled and systems were formed and reformed. Since 1880 the expenditure has been continuously though slowly gaining on the population. The present per capita expenditure averages about one-third of what it is in the North.

The difference in the expenditure per capita of *school population* is still more marked, it being in the South only one-fourth of what it is in the North.

CONCLUSION.

In conclusion, the Commissioner states that, in order to keep abreast of the social movements kindred to school education, he has attended the annual meetings of the Charity Association, the Prison Association, and the Social Science Association.

His reason for this is well stated:

The common school deals with the normal weakling, the child, who is weak because nature has not given him time to grow strong. The school develops his growing strength along the lines of normal growth. But the social science societies deal with the abnormal weakling, the three classes, the insane, the pauper, and the criminal, and are endeavoring to discover what manner of education will cure mental and moral weakness, which tends to become a fixed element of character. This problem presses upon us with increased weight now that the growth of cities progresses so rapidly. Every discovery of method along this line gives important hints for the management of city schools, for the common school strives to prevent the evolution of the abnormal weakling.

The Bureau has, therefore, made investigations as to the illiteracy of criminals with a view to see what effect the common school may be accredited with in the prevention of crime. The general results for the past thirty years prove the important fact that the prisoners in jails and houses of correction include about eight times as many illiterate people on an average as an equal number of people in the community outside the walls of the jail. The penitentiaries do not show so great a disproportion as the jails, having only three and one-fourth times their quota, a sufficient number, however, to show the value of education in the prevention of crime.

EDUCATION IN ALASKA.

The Commissioner and the General Agent of education in Alaska both make reports on the condition of schools and their attendance in that far-distant section of our country. One station is 3,029 miles from San Francisco. Much credit is given to the general agent, Dr. Jackson, to whose industry and enthusiasm the measure of success which has attended educational work in Alaska is largely attributed.

The policy pursued by the Indian Office of making contracts with missionary societies, for the instruction and maintenance of the children in their vicinity, was early adopted by the Bureau. This plan, by which the society shares the expense of the school, secures to the pupils an equal amount of care and instruction at less cost to the Government.

The Commissioner says that on the earnest representations of Commander C. H. Stockton, of the U. S. S. *Thetis*, who had recently returned from a cruise in Behring Sea and the Arctic Ocean, Dr. Jackson was authorized to interest some of the missionary societies in the Esquimaux settlements at Point Barrow, perhaps the most northern land of our continent, Cape Prince of Wales, on Behring Strait, and Point Hope, lying about midway between the other two, where civilizing influences are greatly needed. Dr. Jackson accordingly explained the condition of these settlements to a number of societies which he visited, and the opportunities for labor in the cause of humanity were promptly seized, the American Missionary Association of the Congregational Church selecting Cape Prince of Wales, the Episcopal

Board of Home Missions choosing Point Hope, and the Presbyterian Board of Home Missions taking Point Barrow.

With the Secretary's approval agreements were entered into with each of these societies to contribute \$1,000 toward the cost of their buildings and the expense of travel and supplies. From these new stations favorable information has already been received. The Congregational Society report that two missionaries sailed from San Francisco early in June, taking with them the frame of a house ready to be put up, and that they arrived safely at their destination, the society having already expended \$4,500 on the mission. The Episcopal Board of Home Missions report that their missionary, provided with a building costing \$3,000, had reached Port Clarence, 200 miles from Point Hope, July 3. The Presbyterian board reports that a well-qualified teacher sailed for Point Barrow on June 1, with supplies for two years.

For lack of transportation an inspection of the schools on the western islands has not been possible since their establishment in 1886. This season, through the courtesy of the Secretary of the Navy, permission was granted the General Agent to accompany the Government vessels on their annual cruise to the Arctic, and the commanders were instructed to land at the settlements where schools existed or were to be established. Dr. Jackson started on his long voyage early in May. He was at Afognak June 16, and at Cape Prince of Wales early in July. He is expected to reach Sitka on his return early in October, when he will present a full report of the conduct of the schools in Alaska for the year 1889-90.

In the meantime an increase of the appropriation for the education of children in Alaska is recommended. The work has developed as far as can be expected with the present funds. Teachers who are sent to such distant and difficult fields should be thoroughly well qualified for the work and should be liberally paid for their labor and sacrifices. As an example of these a picture of devotion to the cause of humanity is vividly drawn by the general agent as follows:

The school year at Klawaek opened with sorrow, in the death of Mr. Currie, who was the first teacher the school ever had. Mr. Currie was a native of North Carolina, a graduate of Hampden and Sidney College and Union Theological Seminary, Virginia. He gave his life to Indian education. He did valuable work as teacher among the Choctaw Indians, and when a call came for some one to go to a remnant of Indians in southeastern Texas that were in danger of extinction, he went to them. While there his school-house was burned and his life threatened. To escape the malaria incident to a long-continued residence in that section, he came to Alaska and took charge of the newly opened school at Klawaek under circumstances of great heroism. Far away from any officer of the law he battled alone against intemperance and witchcraft. Upon one occasion four men attempted to carry away one of his pupils (a girl) on the charge of witchcraft. Mr. Currie rescued her, keeping her at his house. A few days afterwards they returned, re-enforced by a party of Hydahs, on another attempt to get possession of her. While some of them vehemently claimed her, others stood near the missionary with open knives. Finally the brother of the girl was intimidated into paying a ransom for her. This Mr. Currie could not prevent, but the girl at least was saved.

Mrs. Currie, being herself a teacher of long experience, was, on her husband's death appointed to his place. Her isolation from all companionship (she was the only white woman in the place, and for eleven months looked into the faces of but two white women), the absence of any officer to enforce the law or look after the peace of the community; the prevalence of drunkenness, witchcraft, and other heathen practices, greatly interfered with the efficiency of the school. This is one of the most difficult places to conduct a school in all southeastern Alaska, and needs a strong, self-reliant, energetic man for teacher. Such an one the board of education hope to secure.

Mrs. Currie, with true Christian heroism, unflinchingly remained at her post until the close of the school year, when she resigned to return to her friends in the East.

But a few of many points, however, have been occupied either by the Government or missionaries. There are many places where schools would be welcome and would do great good, but for the establishment and maintenance of which an additional appropriation will be necessary.

The General Agent furthermore submits the following recommendations, in which the Secretary concurs:

RECOMMENDATIONS.

I. An inspection of the schools of western Alaska by the General Agent. In view of the fact that he has been unable to reach those schools for three years, and as the time has come for establishing new schools in that region, some of which have already been recommended by the Territorial board of education, and as it is probable that a Government vessel will be sent next summer to that section to convey Government officials, it is recommended that arrangements be made for the transportation of the General Agent.

CHANGE IN SUPERVISION.

II. In order that the General Agent may, for the next two or three years, give the larger part of his time to developing the school work in western Alaska, it is recommended: First, that the General Agent be relieved for the coming year from the local superintendency of the Sitka district and be given the local superintendency of the Kodiak and Unalaska districts; second, that a superintendent be appointed for the Sitka district.

PERMANENT SCHOOL FUND.

III. The recommendations of 1886-'87 and 1887-'88 are renewed, which recommendations were also indorsed by the Territorial board of education, that legislation by Congress be made permanently appropriating a sum of money for the education of the children of Alaska, without distinction of race.

The present method of supporting the schools of Alaska by an annual appropriation from Congress is very unsatisfactory. As Congress one year votes \$25,000, and the second nothing, and the third \$15,000, it can readily be seen that neither can the school-board of teachers arrange for the schools until after Congressional action has been taken, nor until such action is had can they be sure that there will be any schools. And not only that, but some years the action of Congress is

not known in Alaska until three months after the fiscal school year commences. A failure on the part of Congress any one year to make the necessary appropriation would close the schools, scatter Government property, and throw the teachers out of employment thousands of miles away from home and friends. The disadvantages of the present system need but to be stated to be seen.

In the Western States and Territories the general land laws of the country provide that sections 16 and 36 in each township be set apart for the use of the schools in said States and Territories. In some of the States this has been a munificent endowment. But Alaska has no townships and no law by which they can be surveyed, and when, in the course of time, the general land laws are extended over it the nature of the country and the peculiar climate and the requirements of the population will prevent to any great extent the laying out of the lands in sections of a mile square. Thus while no school fund is practicable for years to come from the lands, the General Government derives a regular revenue from the seal islands and other sources, a portion of which could be used in the place of the proceeds of the sale of school lands.

COMPULSORY EDUCATION.

IV. The operation of the obligatory attendance law, which was enacted by the Territorial board of education and approved by the Secretary of the Interior, in 1887, has been recently suspended by order of the United States Commissioner of Education.

In view of the importance of some suitable law for securing the more regular attendance at school of the children of Alaska, the Territorial board of education, at its semi-annual meeting, June 14-19, took the following action.

Whereas it is the invariable experience of all who have been engaged or interested for years in the difficult task of attempting to educate and civilize the natives and creoles of Alaska that the greatest obstacles to success are—

First. The want of adequate means of securing the regular and general attendance of the children of these people at the various Government schools; and

Second. The stolid indifference, superstition, and fear of change on the part of the greater number of the parents of such children; and

Whereas experience has also demonstrated that wherever native policemen have been employed and paid heretofore a moderate compensation for gathering these children into the school-rooms, and thus compelling attendance, not only is the average attendance itself largely increased, but an interest in the progress of the pupils and the success of the schools themselves has been gradually and permanently created in these native and creole parents; and

Whereas the Government of the United States is annually appropriating large sums of money for the purpose of educating and civilizing these people and employing competent and zealous teachers for that purpose, who are making great sacrifices by enduring severe privations, general discomfort, and personal isolation among an alien and barbarous race of people: Therefore be it

Resolved by the Territorial board of education, That the Hon. Lyman E. Knapp, the governor of the district of Alaska, is hereby requested and urged to embody in his forthcoming annual report to the Department of the Interior the suggestions we have made herein, with the recommendation that Congress take the subject of compulsory

education of the natives and creoles of Alaska into consideration, and in addition to making the usual appropriations for the schools of the district, add thereto such enactments as will compel the regular attendance of the pupils at such schools as are already established or may be hereafter provided.

The recommendations of former reports on this subject are hereby renewed.

With the granting of an obligatory attendance law, and even without it, the appointment of a native policeman in the native villages where schools exist, whose duty shall be to see that the children are in school, will greatly increase the present attendance.

It is therefore recommended that an allowance of \$10 or \$15 per month be allowed from the school fund for the employment of such men.

V. That Congress appropriate \$75,000 for education in Alaska for the year ending June 30, 1892.

VI. That the salary of the general agent of education be increased to \$2,400 annually.

HOWARD UNIVERSITY.

The catalogue of this institution for the past year shows 365 students, representing nearly all of the States and Territories and several foreign countries, classified as follows:

Theological.....	40
Medical	107
Law	29
College department.....	23
Preparatory	31
Normal and Industrial	136

Of these 78 completed their course.

In the industrial department instruction is given in printing, carpentry, tailoring, shoemaking, mechanical drawing, and other useful handicrafts.

A suitable structure for instruction in the different mechanical arts is greatly needed. A building, equipped as required for a school of technology and gymnastics, can be erected for \$100,000, and for this purpose the trustees ask an appropriation of \$25,000 to be expended in the present fiscal year. They also desire to employ a librarian and teacher of book-binding in addition to those to whom salaries have heretofore been paid. These requests are recommended to favorable consideration.

The following items of appropriation are recommended:

For new building for industrial department.....	\$25,000
For salaries.....	23,800
Care of grounds.....	1,000
For repairs.....	2,400
Books and shelving.....	2,000
Current expenses.....	4,000
Total.....	55,200

THE COLUMBIA INSTITUTION FOR THE DEAF AND DUMB.

The management of this humane institution has continued to be most praiseworthy, and it is commended to the favor and liberality of the Government.

The report from this institution states that there have been 129 students and pupils instructed since July 1, 1889. Seventy-one of them have been in the collegiate department, representing twenty States, the District of Columbia, and Canada. Fifty-eight have been in the Kendall School.

The usual courses of study in the several departments have been continued with success, and a course of lectures on important subjects has been given to the students. Six young men were graduated from the college with the degree of Bachelor of Arts, and one with the degree of Bachelor of Science. Five pupils received the diploma of the Kendall School.

The liberal action of Congress in providing for the assistance of students in response to suggestions in the last report enables the college to meet the full expense of their education.

The receipts of the institution from all sources amount to \$64,830.14, and the expenditures were \$63,970.47; balance on hand, \$859.67.

Estimates aggregating \$66,000 are submitted for the coming year, and the directors propose, if the small increase asked for is granted, to extend the facilities already existing for normal teaching. The Secretary concurs with the statement that this is a great and growing necessity, as there is no school in the country devoted to training teachers for deaf-mutes.

MARYLAND INSTITUTION FOR THE INSTRUCTION OF THE BLIND.

At the end of the last fiscal year it is stated that the District had 19 pupils in this institution. During the fiscal year ending June 30, 1890, 8 were admitted, 1 died, and 5 were discharged, leaving 21 at the end of the year.

The school appears to be prosperous and is doing thorough work. The younger pupils are taught on the kindergarten methods.

Two of the department graduates, Miss Catharine Grady and Mr. Harry N. Roby, are employed as teachers in the institution.

EDUCATION OF FEEBLE-MINDED CHILDREN.

During the year ten of the District children have received education and support at the Pennsylvania Training School for Feeble-Minded Children, under the provisions of the act approved June 16, 1880, at a cost of \$2,467.65. The superintendent reports there seems to have been improvement in the mental condition of all but one of the beneficiaries.

WASHINGTON HOSPITAL FOR FOUNDLINGS.

The health of the inmates of this institution is reported to have been excellent and the mortality low. No contagious disease except "La Grippe" has prevailed. Sixty children were admitted during the year, of whom 11 were adopted. Applications for the adoption of children are rapidly increasing. The total number of employes is 22.

It is intended to start a training school for nursery maids in connection with the hospital.

The receipts during the year were:

United States appropriation.....	\$6,000.00
Membership dues and contributions.....	566.00
Proceeds of entertainments.....	444.83
Endowment fund.....	241.20
Sale of cows.....	36.20
C. B. Bailey.....	16.00
Sale of bottles.....	8.90
Sale of old iron.....	1.75
Total.....	7,314.88

The expenditures were:

Salaries and wages.....	\$3,053.84
Provisions, groceries, ice, etc.....	1,540.02
Nursery food, milk, cows' food.....	1,200.07
Druggists' supplies.....	621.74
Fuel and gas.....	707.75
Clothing, rubber goods, dry goods.....	697.05
Furniture, house furnishings, and baby carriages.....	314.31
Printing, advertising, and stationery.....	153.45
Miscellaneous.....	122.32
Repairs and improvements.....	530.07
Total.....	8,943.82

FREEDMEN'S HOSPITAL.

The following table shows the work of this institution:

	White.			Colored.			Grand total.
	Males.	Females.	Total.	Males.	Females.	Total.	
Remaining June 30, 1890.....	20	9	38	85	74	159	197
Admitted.....	455	79	534	819	841	1,660	2,194
Born.....	4	1	5	91	102	192	196
Total.....	459	80	539	910	943	1,853	2,392
Total in hospital.....	488	89	577	995	1,017	2,012	2,589
Discharged.....	444	75	519	730	803	1,533	2,052
Died.....	20	4	24	165	94	259	283
Still-born.....				11	11	22	22
Total.....	464	79	543	906	908	1,814	2,357
Remaining June 30, 1890.....	24	10	34	89	109	198	232

In the dispensary there were 5,962 prescriptions compounded for outside patients.

Three hundred and fifty-four surgical operations were performed. There were 94 cases of alcoholism treated, 12 of which were colored. There were 193 cases of women treated during confinement, 5 white and 193 colored, only 46 of whom claimed to be married. In the hospital 228 cases of venereal diseases were treated and in the dispensary 541. On the recommendation of the Commissioner of Pensions 128 ex-soldiers were admitted and treated, and, on the recommendation of the Board of Managers of the National Soldiers' Home, 13 were cared for while waiting for transportation.

There have been four fire-escapes erected, two on the main building and one upon each of the female ward buildings.

Congress having made an appropriation of \$2,500 for that purpose, the intention is to build a two-story four-room house for the treatment of contagious diseases.

GOVERNMENT HOSPITAL FOR THE INSANE.

The report of the Board of Visitors discloses the following noteworthy facts regarding this institution:

Number of inmates at the beginning of the fiscal year: Males, 1,075; females, 322; total, 1,397. Admitted during the year: Males, 274; females, 71; total, 345. Whole number treated during the year: Males, 1,349; females, 393; total, 1,742. Discharged: Males, 82; females, 15; total, 97. Died: Males, 112; females, 28; total, 140. Inmates at end of fiscal year: Males, 1,155; females, 350; total, 1,505. Increase within the year: Males, 80; females, 28; total, 108. Of the admissions for the year, 115 were from the Homes for Disabled Volunteer Soldiers.

There are still 5 inmates living who were admitted prior to June 30 1855.

During the year the Toner Building has been opened as a distinct hospital for the sick, with trained nurses and all modern appliances.

The infirmary annex, for which appropriation has been made, is now under contract and is expected to be completed during the fiscal year.

A thoroughly tested fire-steamer of most approved pattern has been purchased and engine-house built. A fire brigade has been organized from the inmates. With the addition of two additional reservoirs there will be an efficient fire force with appliances ready to be used on any part of the buildings.

The great humidity of the present cropping season has proved very detrimental to the agricultural and horticultural products of the institution, nevertheless those products have amounted to \$26,633.28, without consideration of forage crops consumed to the value of \$8,794.80.

Many of the male patients have been employed in farm work, as in excavating for the new building. In this regard the farm affords the

opportunity of substantial benefits to the patients as well as yielding a small profit to the hospital.

For estimates and other details reference can be made to the text of the report.

ARCHITECT OF THE CAPITOL.

The Architect of the Capitol reports the following improvements made on buildings and grounds during the fiscal year:

The heating and ventilating of the Supreme Court room has been improved, so that a constant supply of air may be had and diffused throughout the Chamber.

To furnish air undefiled by gas and smoke, a tower over 400 feet from the Senate wing has been erected in the western grounds, from which a tunnel a hundred superficial feet in capacity runs to the fans which supply air to the Senate Chamber and terrace rooms.

The coal-vaults at the wings have been enlarged, and hydraulic lifts placed at the eastern front. For that at the south front, a long tunnel has been constructed to connect with the terrace rooms.

A large amount of painting has been done and the building kept in a good condition.

As yet no definite arrangements have been made for the purchase of the electric lighting plant for the House of Representatives, or the acceptance of that for the Senate wing; but these plants have been used to great advantage during the present session of Congress, the Government paying only for the services of the workmen engaged in operating them during the session. By the use of these plants a saving in the cost of gas has been effected.

It is stated that as a measure of economy such plants should be purchased. It is understood that the Westinghouse Company has expressed to the Committee on Rules a willingness to change the system of the Senate plant, furnished by them, from a high tension to a low tension at their own cost, and if this change should be made the purchase of the plant is recommended. During the past season electric lighting has been extended in the building and introduced in the terraces, so that now there are in use an equivalent of 492 sixteen candle-power lights on the House side and 632 sixteen candle-power lights on the Senate side.

The marble and granite work of the terrace have been completed, and a number of the rooms fitted up ready for occupancy by committee, nine of which rooms have been occupied during the present session of Congress. All the others will be made ready by the next meeting of Congress.

The Capitol Grounds have been kept in good condition. The north roadway, running from Pennsylvania avenue to the eastern front of the Capitol, has been resurfaced, under a guaranty by the contractor that the same shall be kept in good repair for a period of five years. The

pavement at the east front of the Capitol, laid in 1877, is in a cracked and patched condition, and should be resurfaced in a manner to correspond with the roadway recently improved. An appropriation for this purpose is recommended.

The lot recently purchased for Senate stable and engine-house has been graded and fenced and carriage sheds and a workshop erected thereon.

The alterations and improvements of the Fish Commission building, authorized by Congress, have been completed, and various repairs and improvements have been made to the court-house and the Botanical Garden building and walks.

THE TERRITORIES.

IDAHO.

The census this year shows a population of 84,229, an increase, since 1880, from 32,610, or considerably more than double its former number of inhabitants.

The area of Idaho is 86,294 square miles, or 55,228,160 acres. Of this there are classed 16,000,000 acres as agricultural lands, 20,000,000 acres as grazing lands, and 10,000,000 acres of forests.

The total assessed value of real and personal property in 1890 is \$25,581,305. This does not include any lands unpatented, and many fine farms in high cultivation are yet unsurveyed. Nor are the miners taxed, and they are estimated to represent a value of \$50,000,000. The total bonded and registered indebtedness to October 1, 1890, was \$239,267.95.

The Governor in his report earnestly recommends that, in justice to many of the citizens now occupying lands to which they have no title and to those who are seeking homes, liberal appropriations should be made for the survey of public lands, and in this the Secretary concurs.

It is also recommended that all agricultural lands requiring irrigation be conveyed to the State by the United States. The Governor's argument is that if these lands were under State control a system would be perfected whereby the State could contract for their irrigation and be re-imbursed by their sale after they should be reclaimed. This subject is discussed by the Secretary under the heading of public lands, and his recommendations there made. The Governor also suggests that if the forest lands were placed under State control foresters would be appointed who would protect them from the foraging of speculators and the ravages of fire. He thinks that under wise legislation the timber might be disposed of but not the land, and that if properly managed a new growth of timber would follow these old forests and they could be perpetuated.

The new status of statehood has already attracted a considerable tide

of home-seekers, and it is said that inquiries are being made at the Land Office from every part of the Union.

The Governor endeavors to show the necessity for Congress to make liberal appropriations for selection and survey of school lands, as otherwise actual settlers will have secured all the most desirable lands before school lands can be selected. The Secretary strongly recommends favorable attention to this subject.

Idaho has a total railroad mileage of 941 miles, with a total assessed valuation of \$5,266,065. Over this railroad there were exported during the year ending June 30, 1890, 202,087 tons of products and imported 183,864 tons. The value of the home products marketed during the same time was \$10,395,150. Thirteen out of the eighteen counties of Idaho are in the arid belt, and will require irrigation to reclaim the land. In the other five counties of Shoshone, Kootenai, Latah, Idaho, and Nez Percé the soil is of the deepest and richest black loam, with occasional mixture of sand and clay, and the rain-fall is sufficient without irrigation. The governor states that from 35 to 60 bushels of wheat of excellent quality can be raised to the acre in these counties.

Stock raising is one of the principal industries. The past winter was the most severe ever experienced, and the losses in cattle were very great. The system is being greatly modified and hereafter cattle-men will provide supplies and not depend upon the winter ranges, as formerly. An abundance of feed this summer has put the cattle into excellent condition for the coming winter.

MINING.

Since the discovery of gold in 1860, the mines of Idaho have yielded about \$175,000,000. At first the efforts were confined to placer mining; then quartz mining was undertaken. But the want of transportation and high freights have much retarded the development of these industries. Each year now, however, shows an increase. It is stated that there are mammoth lead-silver mines awaiting railroad facilities for development, and evidences of great universal wealth are given, which industry and enterprise will bring to the surface in the near future.

The increasing demand for labor due to new industries has been steadily met by new arrivals from the States. There is harmony between labor and capital, and wages are liberal, ranging from \$1.50 to \$2.50 per day for ordinary labor, and from \$4 to \$6 for skilled labor.

Referring in a very interesting report about the Indians, to the recommendations of a year ago, the Governor again urges that the Indians should be required to select lands in severalty. This would destroy their tribal relations and make them self-reliant and self-sustaining. The majority of the Nez Percés have already taken homes in severalty, and they are making marked advance in civilization and prosperity. It is strongly urged that Congress should immediately ratify the treaty recently negotiated with the Cœur d'Alene Indians for 250,000 or

300,000 acres of land. The peace and security of a number of settlers demand it.

The United States Assay Office is located at Boise City, and is greatly appreciated by the gold mining interests, as the Government purchases and pays transportation on all bullion, the assay value of which is over 500 fine.

The Territory has constructed without Government aid a capitol building and furnished it elegantly, at a total cost of \$85,000.

The last legislature provided for the establishment of the University of Idaho to be located at Moscow. The site will consist of 20 acres and the building will cost \$60,000.

The Governor presents a most interesting report of the present and projected irrigation of the State, accompanied by specially prepared maps showing the canal system of the Upper Snake River basin and the irrigable area of the Snake River Valley in Idaho.

At present there is no highway or wagon road connecting northern and central Idaho, but under a recent act of the legislature such a road is now being constructed.

MORMONS.

The legislature passed a registry law requiring all who registered to take a rigid oath against bigamy or polygamy, and declaring the Constitution and laws of the United States and the laws of Idaho as the supreme law, notwithstanding the teachings of any church or organization. The leaders of the Mormon Church declared the law unconstitutional and carried it to the courts, and upon final adjudication by the Supreme Court of the United States its constitutionality was affirmed. This is known as the "Idaho test oath." The new State having been admitted without the elimination or alteration of any of the constitutional restrictions and prohibitions against bigamy or polygamy, the Mormons made no attempt to vote at the late election. The Governor thinks they will abandon these practices under a recent official manifesto of the president of the Mormon Church. This may restore them to citizenship.

Idaho is now beyond the Territorial status, having been received into statehood by the act of Congress approved July 3, 1890. Under the provisions of the constitution of the State, and in compliance with the proclamation of the Governor, elections were held for State, county, district, and township officers on the 1st of October, 1890.

There is much more of interest and importance in the very able report of the Governor, which will be published in full, and to which it is not deemed essential here to refer.

WYOMING.

Wyoming was admitted to the Union by act of Congress approved July 10, 1890. The report of the Governor of the Territory, from which most of the facts hereinafter stated have been gathered, is therefore the last that will be made to the Secretary of the Interior.

The first census of Wyoming Territory was taken in 1870, and showed a population of 9,118; that of 1880, 20,789. The census of this year shows a population of the present State of Wyoming of 60,589, exclusive of Indians, or an increase of 191.45 per cent.

According to the report of the Governor the total assessed valuation of property in 1870 was \$6,924,357. In 1890 it is \$30,665,499.11, and it is supposed that this does not represent more than one-third of its actual value.

September 1, 1890, there was a cash balance in the Treasury of \$94,914.02 and a bonded indebtedness of \$320,000, which represented a part of the expenditures for public buildings.

The people of Wyoming have invested \$10,000,000 in works of irrigation, and the length of irrigating ditches exceeds 5,000 miles. The rain-fall averages about 14 inches on the plains and perhaps three times as much in the mountains.

The soil of the State is rich, and needs no fertilizer but rain or irrigation. Hay and small grains are very profitably cultivated. The State has an enormous area of coal land, and its mineral paint is said to be of excellent quality. It has in reserve an untold wealth in its undeveloped resources. Live-stock raising and extensive mining operations furnish an excellent market for all kinds of products.

The people are largely American, young, vigorous, and industrious, and the percentage of illiteracy is very small. Provision is made by law for free public libraries and a small tax is levied for their support, and the law provides for compulsory education. Most of the counties have substantial and commodious court-houses, and the cities and towns have a high class of municipal government. The public buildings are commensurate with the growth in population and revenues. The Territorial public buildings have a value of \$500,000, and the school property is estimated at \$1,000,000.

School lands were leased in two classes, one known as "agricultural and grazing," and the other as "grazing." No lease was made for a longer period than five years, and all leases were subject to cancellation within six months after the Territory should become a State. The proceeds were appropriated to the support of the public schools. Heavy forests cover 7,000,000 acres of Wyoming and there are about 15,000,000 acres having more or less timber.

More than three fourths of the lands of Wyoming are yet open for settlement under homestead and other United States land laws, and offer rich fields for emigrants desiring a new country and early privileges of selection. There are 15,000,000 acres of land unsurveyed. Upon vast tracts of this land, the Governor states, there are immense oil-fields, coal-beds, and boundless forests of valuable timber. He considers that the policy of Congress in the matter of public surveys, restricting the appropriations to the survey of agricultural lands, has been a great disadvantage in the way of retarding development, and

recommends a far more liberal policy in the future. He also states that the public debt, including territorial, county, and municipal, amounts to a trifle over \$1,000,000, while the public property, exclusive of land grants, is worth \$2,000,000. Wyoming has about 1,000 miles of railroad.

AGRICULTURE.

In agricultural pursuits there is noticed an increased development by the opening of new districts. Irrigation has been very successful in redeeming the arid regions, and by reason of the numerous streams of water, said to number 600 in the Territory, this artificial means of producing fertility has yet vast possibilities ahead of it.

The pasturage is of excellent quality and stock-raising, the oldest industry, represents a vast amount of capital. The number of sheep and horses especially has increased during the year.

MINING.

The Governor states that beyond doubt mining presents the greatest possibilities of any of the various resources of the present State of Wyoming.

The coal area is said to exceed 30,000 square miles. Gold, silver, iron, copper, lead, tin, asbestos, mica, magnesium, sulphur, graphite, kaolin, fire-clay, glass sand, granite, marble, slate, sandstone, and limestone, are also being developed. An extensive oil region promises to be one of the principal factors in the development of the new State. A number of flowing wells are now plugged awaiting better transportation facilities or pipe lines. The vast undeveloped resources of this country and the unoccupied territory open for every industry, offer splendid inducements for capital and well-directed labor.

The Governor says there is a constant demand for skilled mechanics and for women for house service. Mechanics receive from \$2.50 to \$6 per day, laborers \$1.50 to \$2.50 and house servants \$15 to \$30 per month and board.

The Shoshone Reservation is the only Indian reservation in Wyoming, and comprises over 1,500,000 acres in Fremont County. A large number of Shoshones and Arapahoes, who still maintain their tribal relation, are resident there. Some complaints are made of their wandering off the reservations, but this does not amount to more than at any other reservation. These Indians are not warlike, and efforts are being made to educate them in farming and other industrial pursuits.

Upon the subject of the preservation and protection of the forests and timber lands, the Governor renews his recommendations that some remedial legislation should be enacted. The great forest fires consume and devastate vast areas, while all the timber cut and used for all purposes does not amount to 5 per cent. of the quantity so destroyed. It is suggested that leasing the timber land under certain restrictions would largely remedy this evil.

The Governor submits a number of recommendations, including the following: Largely increased appropriations for surveys and provisions for the correction by resurvey of erroneous and imperfect surveys. That the surveys be made to include grazing, mineral, and timber lands as well as agricultural. That the arid lands be donated to the State. That early action be taken to secure the full utilization of the waters of the mountain streams. That authority be expressly given for the taxing of the property when located on Indian reservations, and to punish white men for offenses against the State laws when committed on an Indian reservation. He renews the recommendation of one year ago that Wyoming be re-imburse the \$8,000 expended by it in preserving the Yellowstone National Park.

An examination of the finances, resources, educational and industrial condition, and the additional grant of one-half million acres of land by the Government, in the act of admission, for the establishment, maintenance, and support of charitable, educational, penal, and reformatory institutions in the various parts of the State, would seem to warrant the conclusion that this new sister among the States enters upon her changed status with every promise of prosperity and future progress.

ARIZONA.

The Governor gives an interesting account of this prosperous Territory. It has an area of 113,000 square miles, and a population of 59,691 inhabitants. Its claims to statehood are ably supported by the Governor.

Its financial record shows that the total taxable property is worth \$28,050,234. But it is said that this is not over one-half or one-third the true valuation. The average rate of taxation throughout the Territory is \$2.93 on the \$100. The total Territorial, county, municipal, and school debt amounts to \$3,421,688.78. The items of the Territorial debt are set forth in the report. It is believed that the recent act passed by Congress will enable the Territorial authorities to fund all this debt at 5 per cent.

It is suggested that Arizona does not need the creation of a land court by Congress, but the Secretary is unable to approve the views of the Governor on this subject.

The railroad mileage of Arizona is 1,093 miles. It is stated that a north and south railroad line through the Territory is an absolute necessity. This has already received your examination and upon it you do not again probably require the views of the Secretary.

There are 701 miles of irrigation canals in the Territory, and 295,200 acres of land irrigated. The arable land which is practicably irrigable amounts to 5,550,000 acres.

The Governor solicits the General Government to grant to the Territory all the public lands within its borders for reclamation and develop-

ment. It is claimed that where irrigated Arizona has the richest soil, and is the best hay and vegetable and fruit country, in the world.

There were 200,000 head of cattle shipped from the Territory in 1889 and the first half of 1890.

The output of gold, silver, and copper mined in 1889 amounted to \$4,510,343.20.

Arizona has timber enough for home consumption for many years, the pine forests of the San Francisco Mountains covering 1,750,000 acres.

The public school system is one of the best in the Union. The value of school property is \$280,000; the expenditures for schools amount to \$143,000. The number of children between six and eighteen years of age is 10,700, and of these 7,000 are enrolled in 190 public schools.

The Governor considers that the Territory should be permitted to select its school lands, the sixteenth and thirty-sixth sections, without waiting for statehood. This the Secretary recommends.

The public buildings, all erected at Territorial expense, and all creditable structures, are the Territorial prison at Yuma, the university at Tucson, the insane asylum at Phoenix, and the normal school at Tempe.

The Governor states that the Indians are a continual menace and obstruction to progress, and requests their removal from the Territory. As an instance of the trouble they cause, it is said that in November, 1889, while Sheriff Jeff Reynolds, of Pinal County, and his deputy were taking eight Indian murderers to their punishment they were overpowered and killed and the Indians escaped. The murderers have since been run down and captured or killed, except one. Since that there have been several murders by Indians. The Navajos could muster 5,000 warriors, but they are peaceful. Otherwise they show few signs of civilization.

The Papagos, Pimas, Maricopas, Yumas, Mohaves, Hualapais, and Supais are peaceful and self-supporting, many of them farming. But the Apaches of the San Carlos Reservation are dangerous and, in the Governor's opinion, should be removed and the reservation thrown open to settlement. If this is not done he thinks the reservation should be reduced and the Indians disarmed. The Governor does not suggest the exact spot where these Indians to be removed would be entirely welcome. The subject is one of great difficulty, but it is hoped the earnest efforts of the Commissioner of Indian Affairs will bring about soon a better and more satisfactory state of affairs. Some of the Apaches, it will be remembered, are already in charge of the Department of War. Whether it wants any more may be well questioned.

MORMONS.

There are 12,000 Mormons in the Territory. It is expected that they will people the Territory more rapidly in the future than in the past, and in view of this, restrictive legislation, such as has been adopted in

Idaho, is recommended. The Secretary calls attention now to his remarks on this subject under the heading of Utah, where the subject is discussed.

The following recommendations are made by the governor and approved by the Secretary as noted:

(1) That an enabling act for the admission of Arizona as a State be passed by Congress.

(2) That all the public lands within Arizona be donated to the Territory, title to pass upon admission as a State.

(3) That all school lands within Arizona be donated to the Territory for school purposes, and provision be made for the selection of good sections in lieu of bad.

This Territory requires more than ordinary assistance to enable it to overcome the great obstacles inherent in its soil and surroundings, and with due safeguards the above requests ought to be granted.

(4) That the Apache Indians, who are now under military surveillance on San Carlos Reservation, be removed from the Territory and the reservation opened to settlement.

This is hardly practicable, for there is no place they could be placed without a great and reasonable resistance by the white people there. An Apache Indian is not a desirable neighbor; and while the good people of Arizona like him not, others who have never become accustomed to him at all like him less.

(5) It is further recommended that all Apache Indians on reservations under military guard be disarmed, and that they be prohibited from the possession of rifled guns and fixed ammunition, and that it be made a felony for any person to sell or furnish the Indians such guns and ammunition under similar penalties as are imposed for the sale of liquor to Indians.

This recommendation is approved. It has been necessary to keep a military officer as their agent for some years. Yet murders occur, and more than a hundred are now confined at Fort Union. It is a question of force, and the resistance to complete subjection to law and order should be made as small as possible.

(6) It is earnestly urged that if the Indians are not removed that the limits of their reservation be reduced, and the mineral and coal lands on the reservation be segregated and made available.

This is approved. But it is believed to be impossible without an outbreak, unless preceded by disarmament.

(7) It is requested that Congress appropriate funds for the erection of buildings to use in the public service in Arizona.

(8) It is recommended that the provisions of what is known as the "Idaho test oath," be made applicable in Arizona.

(9) That the act now before Congress which provides for a fourth judge in Arizona be passed.

(10) That the salaries of the present judges in Arizona be increased to \$5,000 per annum.

(11) That appropriations be made by Congress to pay the Governors and secretaries of Territories the amounts allowed them by law under section 1545, Revised Statutes of the United States, 1878.

(12) That the pay of legislators in Arizona be increased to \$10 per day.

(13) That Congress appropriate a reasonable sum for artesian well-boring in the Territory.

(14) That all public lands within the Territory be surveyed.

The requests from 7 to 14, both inclusive, are submitted upon the very able arguments of the Governor, who, the Secretary believes, is exceedingly well qualified to determine what the Territory most requires.

NEW MEXICO.

The Governor submits an extended and interesting report, conveying much valuable information in relation to the Territory.

The unsettled condition of titles to Spanish and Mexican land grants is discussed by the Governor as the matter of paramount consideration and importance to the people. But it is not deemed necessary to here dwell upon the subject, as the earnest efforts of the administration for the establishment of some competent tribunal to adjudicate these questions has resulted in the consideration by both houses of Congress of bills for the establishment of United States land courts for this purpose. It seems probable, and it is greatly to be desired, that an act may be passed before the close of the present Congress.

Referring to the feeling of extreme disappointment of the people on account of the failure of Congress to act favorably upon their application for admission to the Union as a State, the Governor says this feeling has been heightened by the recent admission of other Territories. Meanwhile, he states, the people have been proceeding in a dignified manner to arrange every preliminary that could possibly be required for admission. The constitutional convention which prepared a constitution in September, 1889, was reconvened on August 18, 1890, and during a session of three days perfected, by amendments, the constitution for submission to a vote of the people on October 7, 1890.

The census shows the population to be 144,862. The Governor estimated that it would amount to 180,000. The total registered vote in 1888 amounted to 42,871, which shows a larger proportion of voters to population than in the east, due naturally to the large number of miners and others without families.

PUBLIC LANDS.

During the fiscal year surveys upon Government land were approved and work was executed to the extent of 581 miles. The work has been limited by the insufficiency of the appropriation.

The surveyor-general recommends that a tract on the Upper Pecos, principally composed of mountains intersected by cañons, and admirably adapted for the purpose, be set aside as a national park. This recommendation is most heartily concurred in by the Governor, and is approved by the Secretary.

The Governor urges that if the Territory is not to be promptly admit-

ted an act should be passed giving her immediate possession of the school lands now reserved from entry that are unoccupied, as there is more urgent need for such aid now than will probably exist later.

IRRIGATION.

As in other Territories, there are in New Mexico vast areas of arid land which can only be redeemed for cultivation by irrigation. The total rain-fall at Santa Fé, where the only signal office of the Territory is located, was during 1889 only 7.89 inches, and this is said to be 2 inches more than the average. If all that territory over which the average rain-fall is less than 20 inches is rightly classed as arid, an enormous body of land in New Mexico can be reclaimed only by artificial means.

A large number of companies have been incorporated during the past year for irrigation, and those already in operation are producing most satisfactory results in the estimation of the Governor. One company has started, he mentions, a model farm, and has forty varieties of crops growing in perfection on land which only a year ago was part of a vast cattle range. Such evidence demonstrates the vast possibilities of the future of that region once styled the "American Desert."

The subject of irrigation and reservoirs is elsewhere discussed by the Secretary in this report.

AGRICULTURE AND HORTICULTURE.

The Governor states that the crops of all kinds are fully up to the average and the acreage has been increased. Yet sufficient grain or vegetables is not raised to supply the home demand. This presents a great inducement for farming and gardening on irrigable lands. The valleys of New Mexico seem to be specially adapted to fruit trees and vines, and the fruit produced is of excellent size and beauty. Foreign varieties of grapes and other fruits, and almonds, are found to here come to perfection. It is estimated that the Territory will ere long take high rank as a fruit-growing country.

STOCK RAISING.

Times have become better for the cattle industry. Pasturage has improved; buyers are plentiful, and prices advance. Sheep raising is one of the most prosperous industries in the Territory. The passage of the tariff bill has greatly enhanced the price of wool, and the local demand for mutton has increased the value of the flocks. It is said the wool clip for this year will amount to 10,000,000 pounds.

MINING.

The prospects of the mining industry are reported to be very bright, and the stimulus given to this industry by the tariff and silver legislation of the present Congress is resulting in the re-opening of silver and

lead mines which have heretofore been abandoned. The value of gold, silver, copper, and lead mined in 1889 exceeded \$4,000,000. Increased railroad facilities will develop a great many other mines now inaccessible for transportation. The lumber industry is very prosperous and forests of great value cover portions of the Territory.

SCHOOLS.

There is a gradual improvement in the public schools. The Governor states that the want of a school fund is severely felt. Sufficient English-speaking teachers can not be secured for the small salaries payable from the current tax. For this reason he urges that they should have immediate possession of the school lands.

INDIANS.

The Governor gives a very interesting report of the Indians upon the several reservations, showing the prosperity and progress made by these tribes, especially the Pueblos and Navajos. Several fine schools, one at Santa Fé and the Government training school at Albuquerque, are doing excellent work in educating the Indians. In the latter, which accommodates over two hundred children, farming, carpentry, cooking, shoe and harness making, tailoring, sewing, laundry-work, and general house-work are taught. There are a number of other good Indian schools in the Territory. Agricultural and industrial pursuits are being conducted with considerable success upon the reservations.

BUILDINGS.

The capitol and the penitentiary are the only Territorial public buildings which are in a completed condition. The last legislature made provision for founding five new Territorial institutions as follows: The University of New Mexico at Albuquerque, an agricultural college and agricultural station at Las Cruces, the New Mexico School of Mines at Socorro, and an insane asylum at Las Vegas.

The only one of these yet in operation is the agricultural college and experiment station, which receives an appropriation from the Government. The importance of this experiment station is clearly shown by the Governor. The observations taken and experiments made in agriculture and horticulture will be of especial value by reason of the peculiar natural condition of New Mexico as to altitude and climate.

GOVERNOR'S PALACE.

Among all the buildings in the United States, the Governor states, few possess so much historic interest and value as the Governor's Palace. For nearly three hundred years it has stood as the living center of everything of historic importance in the Southwest. It is older than the settlement of Jamestown and Plymouth, and through all these years,

under Spanish, Pueblo, Mexican, and American control, it has been the seat of power and authority. The ravages of time have made inroads upon the building and Congress has recently made an appropriation to aid in repairing and restoring it. It is now within the jurisdiction of the Department of the Interior, and the Secretary recommends it to the most favorable consideration and care of Congress.

UNDEVELOPED RESOURCES.

The undeveloped resources of this Territory will in the near future yield large returns to enterprise and labor. Great pine forests, the fertile wheat lands of the northern valleys and the broad acres adapted to alfalfa and other grasses, and especially to oats, which is said to be of a very superior quality, weighing from 34 to 40 pounds to the bushel, must sooner or later be changed into lumbering camps and farms.

There exists in New Mexico this strange and anomalous condition, that although wheat, corn, oats, alfalfa, and fruits of almost every variety could be raised in great abundance and of most excellent quality, the people actually buy large quantities of all these products in other markets. The Governor estimates that the amount paid annually by the people for these few staple articles which could be profitably raised at home is over \$1,200,000.

Public attention being drawn to these facts, the remedy will come with time and with the increase of population by immigration.

UTAH.

The population of Utah, as found by the census just completed, is 206,498, an increase of 62,535 since 1880, or about 43.44 per cent. From the Governor's report, it appears that from 1881 to 1889 the population increased 16,094 by Mormon immigration. Recently this has been chiefly from Scandinavian countries. The average annual immigration of this character is about 1,800, and is largely of the class of *assisted* immigrants. The increase in the value of property of cities and towns over 1889, as shown by the assessment rolls, is 130.6 per cent., while the increase of indebtedness of the same is only 27 per cent.

The total assessed value of property, real and personal, was in 1889, \$51,917,312, and in 1890 \$104,758,750, showing an increased assessed valuation of \$52,841,421, or more than 100 per cent. during the year.

PUBLIC LANDS.

The acreage and settlement of public lands from the opening of the land office in March, 1869, to the 30th of June, 1890, amounted to 21,193,325 acres. The Governor again calls attention to the vast amount of unoccupied land, amounting to 31,000,000 acres, owned by the Government in the Territory. Under the law of October, 1888, sites for reservoirs have been reserved on which water may be stored to be

used for agricultural purposes, and it is anticipated that by means of artificial methods a fair amount of land may be reclaimed. Much of the unoccupied land can not be used profitably for other than grazing purposes, and the people of Utah are interested in raising horses, cattle, and sheep. Having spent large sums in improving their live-stock, they are anxious to have the Government take some action that will enable them to acquire title to the grazing lands, or at least secure their use to them.

This question is of growing importance with each succeeding year. There seems danger that the natural grasses on the unoccupied lands may be destroyed. With the destruction of such forage plants the land will cease to have any value. The Governor therefore recommends that the title to unoccupied lands be vested in the Territory, the proceeds arising from the sales to be used for the improvement of the water supply, or as an endowment for the public schools; and, in any event, that the General Government should take some action that will enable the people to secure title to the grazing lands.

Under present conditions, the title being vested in the Government they are looked upon as lands which may be used by any one, and the man who to-day finds a place to feed his cattle, may be to-morrow surrounded by other men with cattle, and in a short time the forage which would supply a limited number is completely destroyed. This situation also aggravates the existing bitter antagonism between the sheep and cattle interests, and is proving a blight to them and to the Territory itself. It is predicted that unless something is done by the Government to protect the grazing lands, and to provide adequate protection to those engaged in raising live stock, this valuable industry will soon be practically destroyed.

SCHOOL LANDS.

The total grant to the Territory of school lands is 46,080 acres. The water supply having been appropriated for use on lands cultivated by settlers, when the school lands are offered for sale there will be no water to use upon them, and this will render the greater part of them practically valueless. It is suggested that the grant should be increased and the legislature should be authorized to take some action respecting the sale of lands already granted.

IRRIGATION.

The question of irrigation is receiving, as it demands, a great deal of attentive consideration by the people, as some artificial method must be employed to water the lands until a change of climate alters the natural conditions. The water supply in these arid regions is derived from the rivers which have their source in the heart of the great mountain ranges. They are fed by the melting snows and find their

way to the valleys below through deep cañons. The water is diverted from these cañon streams at or near the mouth of the cañon by means of canals and spread over the land.

PUBLIC BUILDING.

The demand for a public building for Federal offices at Salt Lake City is again urged, as a measure of economy, and for the protection of the public records.

The Governor recommends that the old capitol building at Fillmore be given to the Territory, as it is gradually falling into decay, and contentions having arisen as to the title to the land on which it is erected, Capitol Square is being built upon by citizens.

The recommendation is renewed that the convicts confined in the penitentiary be placed at work, and that their surplus earnings be given to those dependent on them, or to themselves when their terms expire. As matters are, the innocent families are frequently the ones who are punished the most. The convict is well cared for and lives in utter idleness.

The insane asylum building is being greatly enlarged at a cost of \$163,000, and when completed will be one of the finest institutions of the kind in the West.

The Deseret University has opened under very flattering auspices, and the Reform School was ready for the reception of inmates last fall.

The Industrial Home and Agricultural College, with other institutions, are mentioned favorably in the report and appear to be in a flourishing condition.

INDIANS.

In regard to the Indians, the Governor says there are about fifteen hundred, remnants of former Pi-Utes, Shoshone, Pai Vants, Piedes, and Ute tribes, scattered through the Territory. About six hundred of them are engaged in farming and stock-raising. The remainder roam at will, having renounced their tribal relations. They are degraded and ignorant and are engaged in hunting, fishing, begging, and too often stealing. He recommends some Government provision for their support and care.

Complaint is made that straggling bands of Ute Indians from the Uintah Reservation in Utah, the Pine Ridge Reservation in Colorado, and the Navajo Reservation in New Mexico, are at times permitted to leave their lands and are committing serious depredations upon the settlers of Grand and San Juan Counties. This irregularity will be corrected through the Indian Bureau.

Vigorous protest is again made against the removal of the Colorado Utes to Utah, and attention is called to the action of the Territorial legislative assembly at its last session, asserting that the removal of the

Indians would work injustice and hardship to many deserving settlers, and that the presence of the Indians would be a menace and hindrance to the settlement of Utah.

The Governor thinks Utah has its share of Indians in those on the two reservations already existing there.

STOCK, MINING, AND OTHER INTERESTS.

The live-stock industry is rapidly growing in the Territory. The wool clip for 1889 is estimated at 11,575,000 pounds; sheep exported at 260,000, and cattle exported at 30,000. Extensive stock-yards are about to be established at Salt Lake City, and also packing-houses.

The mining industry has, it is claimed, been to a large extent the basis of all the real prosperity which has come to the Territory. The past year has been a very successful one to the miners, and many important discoveries have been made in the different mining camps.

The passage of the silver bill by Congress has had a most stimulating and beneficial effect. The yield of gold, silver, lead, and copper since 1878 has amounted to \$78,495,045.46. The yield in 1889 was \$8,830,080.50. A comparison of the yield of 1889 with that of 1878 shows an increase of over 73 per cent. in eleven years. About 60 per cent. of the amount is expended in the Territory for labor and supplies, affording a home market for surplus labor and products.

The report gives the following graphic description of the great manufacturing of salt in the Territory:

The production from the waters of the Salt Lake, by evaporation, was commenced by the first settlers in the Salt Lake Valley. Since then the industry has grown to quite large proportions. Along the shores of the lake salt farms have been taken up. These farms are divided into blocks of 2 or more acres. A hard bottom is prepared and the salt water is run in to the depth of about 6 inches. Because of the dry atmosphere the salt crystallizes rapidly. As soon as a surface of salt is formed the water is drawn off, and, after a day or two, the salt is gathered into piles and is finally shipped to the mining camps, where it is used for chloridizing ores, and to points east and west. When the crude salt is refined it makes a superior article of table salt. The price of the crude salt now ranges from \$1 to \$2 per ton, but the price is being reduced by competition. The waters of the lake are about 18 per cent. salt.

The general business prosperity which commenced some two years ago has continued until now it has reached nearly all the central and northern counties. Millions of dollars have been invested in real estate and an era of building has succeeded. Vast beds of coal, iron, and other minerals only await development, and the steady tide of immigration and influx of capital indicate that they may soon be developed and utilized.

FINANCES.

The finances of the Territory are reported to be in a healthy condition as the result of this prosperity, which is expected to continue.

A bank statement, from a number of banks reporting the condition of their business June 30, 1890, as compared with the same date 1889,

and including fifteen new banks reporting, shows an increase of capital of 61.1 per cent., and increase of deposits of 82.7 per cent. The capital June 30, 1890, was \$3,951,530 and deposits \$9,572,286.45.

RAILROADS.

There are now 1,183 miles of railroad in the Territory and additional lines in process of construction. Over the Union Pacific lines above 777,971,796 pounds of freight have been carried during the past year, and over the Rio Grande Western 765,004,000 pounds.

SCHOOLS.

The last legislative assembly passed a public-school law which the governor applauds as a patriotic act. By this law the schools have been made free and have been classified. A provision has been adopted favoring compulsory education, but, as the Governor states, not so as to be effective. The different changes are set forth at length in this report. The following, in this connection, is deemed worthy of exact quotation, as expressing the Governor's opinion:

With a free-school law in force throughout the Territory, the necessity for the schools established by the different religious denominations opposed to Mormonism will gradually cease.

These schools have performed a valuable work. At a time when the district schools were under Mormon control and Mormon history and doctrines taught in them, they afforded the non-Mormons the opportunity of having their children educated under different and better influences.

But denominational schools are opposed to the principles upon which our Government was established, and the non-Mormons will be glad to see the day come when the last one will have closed its doors forever.

I know of no reason why I should qualify the opinion previously expressed, that the Mormon Church has determined to and is now engaged in the work of establishing church schools throughout the Territory. The number of these schools is being gradually increased, with but one object in view, that of teaching their children the principles of their religion as a part of their education.

The Governor again urges that the appointment of selectmen, clerks, recorders, superintendents of district schools, and assessors by the Federal Government is the only way to effect a permanent and thorough reform in the municipal and county governments. He thinks it absolutely necessary that some such action should be taken to secure a population in sympathy with the Government. Under the present system the Mormons are in control in a great majority of municipal subdivisions, and apostasy from Mormonism involves loss of friends, oppression, and many hardships. A bill reported by Senator Edmunds is thought to embrace a portion of the desired legislation.

POLITICAL.

Salt Lake City and Ogden, the two most important cities in the Territory, were carried by the Liberal party (non-Mormons) in the elections for members of the legislature in 1889, and for municipal officers,

in February, 1890, and are now under non-Mormon control. The same result followed the elections for school trustees in July, 1890.

At the general election in August, 1890, for county officers, the Liberal party carried only four counties and the People's party (Mormon) carried twenty-one. The governor thinks Congress should interpose with proper legislation.

While, he says, it may be true that no specific orders emanate from the church, directing the people in their political action, in other ways its influence is strongly effective. Subserviency to the leaders of the church, and blind faith in them by orthodox Mormons, subject both their thought and action to their leaders. Some improvement in this regard is being made by contact with other sects, through commercial relations, but the constant appeals of their leaders for Mormon unity still welds together the larger body of them.

The non-Mormons of Utah urge that they should have the benefit of a law similar to that passed by Congress for Idaho, which, in the bill providing for the admission of the State, made what is known as the "Idaho test oath" a part of the election law of the new State. They ask for the passage of the Cullom or Struble bill, and also the bill reported from the Judiciary Committee of the Senate by Senator Edmunds.

The Governor's report is dated September 9, 1890, and at that time he states that the Mormons publicly claim that the church does not now sanction plural marriages, but at important meetings held under the auspices of the church, resolutions have been adopted vigorously declaring their intention to remain true to the old faith with all its teachings and practices; and that it is still generally believed by the non-Mormons that polygamous marriages are being entered into under the secret sanction of the church, which has been driven to such methods by the effective enforcement of the law.

Since the period at which the Governor wrote, however, great changes have taken place in the professions of the Mormons and the public declarations of the Mormon Church. There was handed to the Secretary of the Interior by John T. Caine, Delegate to Congress from Utah, a written communication of October 1, 1890, in which attention was called to the following declaration of Wilford Woodruff, president and highest authority of that church:

SALT LAKE CITY, UTAH, September 24, 1890.

To whom it may concern:

Press dispatches having been sent from Salt Lake City, which have been widely published for political purposes, to the effect that the Utah Commission, in their recent report to the Secretary of the Interior, allege that plural marriages are still being solemnized, and that forty or more such marriages have been contracted in Utah since last June or during the past year; also, that in public discourses the leaders of the church have taught, encouraged, and urged the continuance of the practice of polygamy:

I, therefore, as president of the Church of Jesus Christ of Latter Day Saints, do hereby in the most solemn manner declare that the charges are false. We are not teaching polygamy or plural marriage, nor permitting any person to enter into its

practice; and I deny that either forty or any other number of plural marriages have, during that period, been solemnized in our temples or in any other place in the Territory.

One case has been reported in which the parties alleged that the marriage was performed in the Endowment House in Salt Lake City in the spring of 1889, but I have not been able to learn who performed the ceremony. Whatever was done in this matter was without my knowledge. In consequence of this alleged occurrence the Endowment House was by my instructions taken down without delay.

Inasmuch as laws have been enacted by Congress forbidding plural marriages, which laws have been pronounced constitutional by the court of last resort, I do hereby declare my intention to submit to those laws and to use all my influence with the members of the church over which I preside to have them do likewise. There is nothing in my teachings to the church or in those of my associates, during the time specified, which can reasonably be construed to inculcate or encourage polygamy, and when any elder of the church has used language which appeared to convey such teaching he has been promptly reprov'd; and I now publicly declare that my advice to the Latter-Day Saints is to refrain from contracting any marriage forbidden by the laws of the land.

WILFORD WOODRUFF,

President of the Church of Jesus Christ's Latter Day Saints.

Mr. Caine added in his letter that this declaration was entitled to great weight in any consideration that might be given the subject, and seemed indeed conclusive and "the very result at which the Government has been aiming so long."

In the conversation which took place when this letter was delivered, it was objected that Mr. Caine and the president of the church would have to meet the specification of forty cases with more than a general denial, and that the president was without authority to change the doctrines of the church; that this belonged, if to any, to the high council or general conference.

Mr. Young, Mr. Cannon, and Mr. Caine have, with some others, presented the claims of their church to confidence and favor.

After the conversation with Mr. Caine there followed (October 6th) a general conference of the Mormon church, and the proclamation above set forth was unanimously ratified. Addresses were there made to the people on the subject by the president and leading apostles. The newspaper reports of these addresses furnished by the governor are annexed and should be read in connection with the proclamation. [Appendix D.]

What is expected because of these proceedings, is, no doubt, a removal of the Utah Commission; the preservation of the elective franchise to the members of the church in all the States and Territories, where they may be and a test oath may be required of them; a restoration of the property of the church; and possibly the admission of Utah to Statehood with or without a test oath against polygamy. The present laws should not, however, be changed on these professions alone. These can be unmade by the same body that has made them. The "revelation" sanctioning polygamy remains unchanged. The mormons, by their works, must prove their declarations to be made in good faith, abandon polygamy, and conform to the practices of our people in social and home life, acknowledge and prove their allegiance to the United

States Constitution by obedience to the laws made pursuant thereto by a loyalty equal in time and strength to their past disobedience. The present system of laws against Mormon practices has been constructed by legislative wisdom, sanctioned by judicial decree, and enforced by the Chief Executive of the nation. Its object is not attained by securing a proclamation of obedience from those who have so long resisted it. Its purpose will be accomplished only when the opposing system shall have lost its power, even if it regains the will, to work the evils of the past.*

UTAH COMMISSION.

At the summer session held after the August, 1889, election, provision was made for Salt Lake City election to be held February 10, 1890, by appointing a chief registering officer and seven assistants, and issuing a circular to guide them in their duties. Upon complaint of irregularities practiced by those officers, the Commission held a meeting at Salt Lake City on the 10th of December, 1889. After a full hearing, the Commission rendered its decision on December 19, acquitting the officers.

Instruction was given also that equal facilities be given all legal voters for registration; that the registrars might inquire diligently and reasonably in any legitimate mode as to persons maintaining the polygamous relation, and on other preliminary questions they should accept the affidavit of the voter; a refusal to be at their own risk of showing the falsity of the affidavit. The registrars were cautioned that in the exercise of these functions they acted judicially, and as there would be probably no redress for a wronged voter, justice should be most carefully administered.

The Commission, on January 20, 1890, again convened at Salt Lake City, and complaint was then made that the registrars refused inspection of the registration oaths. The registrars answered that this action was necessary to enable them to compare the signatures with names entered on the books to be used by the judges of election, and in this, as a discretionary power of their office, they were sustained.

Pending these proceedings application for mandamus was filed in the United States district court by some of the refused voters against two of the registrars, asking that the names of plaintiffs might be placed on the registration lists. On the 18th the court decided against the complainants.

There has arisen a difference of opinion relative to the legal meaning of the term polygamy, which it is believed should be settled by legislation. The Commission has been of the opinion that if the plural wife has died or been legally divorced, or there has been an open and notorious separation, that the polygamous status of the husband is at an end. But others hold that once a polygamist always a polygamist until amnestied by the president.

* There are other facts and comments to be found in the report of the Utah Commission, next following, and in the reports of the governors of Arizona, New Mexico, Idaho, and Wyoming.

Some of the registrars acted upon the latter opinion. The grounds for these views are stated at length in the report of the Commission.

They also make the following statements:

The municipal election of February 10 was fair and the Liberal ticket was elected by from 700 to 800 majority.

July 14, elections were held for school trustees in Ogden, Provo, and Salt Lake City, under the supervision of the Commission, and the Liberal party attained control of the school in the latter city.

At a general election in August for commissioners to locate university lands and for precinct officers the Liberals were successful in Salt Lake City.

Since September 1, 1879, elections have been held in twenty-four cities and towns, at which three hundred and thirty-two municipal officers were elected. These were in addition to five hundred and fifty-five Territorial, county, and precinct officers elected at the general election.

The Commission has appointed three hundred and forty-eight registrars, eleven hundred and forty-eight judges of election, and issued eight hundred and eighty-seven election certificates.

The numbers of registered voters in Salt Lake City and in the Territory are given in the report.

When the Commission took charge of the "Industrial Christian Home Association" there was a building under way which has now been completed and partially furnished as a large and commodious brick building for the occupancy of "dependent women who have renounced polygamy, and the children of such women of tender age; women and girls with polygamous surroundings, in danger of being coerced into polygamy; girls of polygamous parentage anxious to escape from polygamous influences, and women and girls who have been proselyted elsewhere and removed into the Territory in ignorance of the existence of polygamy." However, but few of these classes have availed themselves of this generous offer.

If the Mormon Church would declare against polygamy there is little doubt but that the people would generally accept the declaration as binding upon them, but instead of doing this every effort of the Government to suppress the crime is denounced as persecution. In April, 1890, Wilford Woodruff, a disfranchised polygamist, was chosen "Prophet, Seer, Revelator, and President of the Church of Jesus Christ of Latter Day Saints in all the World." In his address to the conference, speaking of the book in which the doctrine of plural marriage is found, he said: "This book of revelations, like other records, will go down to the end of time and into eternity." Other leaders talked in the same strain.

President George Q. Cannon said, in February, 1890:

"The doctrine of polygamy was accepted many years ago as a revelation from God. That revelation stands; we can not wipe it out by a declaration of man. * * * Some of us believe the revelation is a command from God to take plural wives. I so consider it. * * * Others consider it as permissive."

In October, 1889, one Jespersen pleaded guilty to a plural marriage, consummated in May, 1889, in the endowment temple in Salt Lake City.

It is believed from the reports of registrars that 41 male persons have contracted plural marriage since June, 1889, and yet there are many communities where there are no anti-Mormons to act as registrars, and as the greatest secrecy is observed it is probable that a very large proportion are not reported.

There have been 220 indictments for crimes against the marital relations since September 1, 1889. There have been 152 convictions, 39 indictments are pending, 202 cases have been reported to United States Commissioners, and 149 held to bail.

The recommendation of last report for legislation is renewed. In addition it is recommended that the Commission be authorized to issue binding instructions to the registrars; that the registrars be made personally liable for any willful act of commission or omission, and that a test oath similar to that of Idaho be prescribed.

Since the date of this report the president, Woodruff, has proclaimed an abandonment of the practice and doctrine of polygamy; and this has been confirmed by an order of the council or conference of the church. Comment and recommendations upon this subject are made by the Secretary upon the report of the governor of Utah, preceding this of the Commission.

Mr. Cannon, referred to in the Secretary's remarks, is a son of ex-President Cannon, above mentioned by the Commission.

ALASKA.

The Governor of Alaska comments upon the difficulty of acquiring exact information in regard to this Territory owing to its vast extent and the small means of communication, but states that the commerce of the Territory is large and important and yearly increasing in volume. The exports consist, for the most part, of furs, skins, deer-horns, ivory, bone, oil, gold, silver, and other valuable ores, bullion, fish and canned products of fisheries, fertilizers, Indian curiosities, berries, etc. The imports are goods of all kinds for trade with the natives and resident whites: coal, lumber, machinery, furniture, provisions, material for canning, and other manufacturing enterprises. In the matter of the fur trade the Governor states that about 100,000 full-sized sealskins were taken by the Alaska Commercial Company during the year and that probably half as many more were captured at sea and stolen by poaching vessels.

FISHERIES.

The importance of the Alaskan fisheries in a commercial point of view may be gathered from the number of vessels employed in that industry, though part of the carrying business in southeastern Alaska was given to the regular line of mail steamers. Excluding from enumeration the steam launches, tugs, fishing-boats, and scows employed by the various canneries in the direct work of taking and preparing the fish for market, the ships employed in transportation to San Francisco and ocean work were 106.

Thirty-six salmon canneries were in operation during the year, representing with their equipments a capital of over \$4,000,000, and their pack amounted to the enormous number of 702,993 cases of 4 dozen 1-pound cans. The growing importance of the business may be illustrated by comparing the above figures with the results of former years. The record stands as follows:

Year.	Total pack.	Year.	Total pack.
	<i>Cases.</i>		<i>Cases.</i>
1883.....	26,000	1887.....	190,200
1884.....	45,060	1888.....	439,293
1885.....	74,800	1889.....	702,993
1886.....	120,700	..	

The Governor states that the seal fisheries are not confined to the catch on the Pribiloff Islands, where only 100,000 are allowed to be taken. Of those captured by the revenue-cutters because illegally taken in the waters of Alaska during the year, 2,463 skins were sold for the sum of \$21,256, and it is claimed that more than 20,000 skins were successfully carried away by poachers to Victoria.

The importance of protecting the fishing business by appropriate legislation is strongly urged by the Governor. In many places the salmon fishing is overdone, and in many more, unwise and destructive methods are employed. Aside from the business interests of the white people, the actual subsistence of the natives is largely concerned. They are bound to their local resorts, fishing-grounds, and habits of their ancestors. They know no other way of life or means of subsistence.

MINING AND MINERALS.

The Governor states that attention was mainly given during the year to the practical development of claims already located, though a large number of new locations have been made. In working the quartz mines many of the ores are sent long distances to the smelters for reduction, while in other cases the ores are piled up awaiting the erection of mills.

There are thirteen stamp-mills in the Territory for crushing ores and obtaining the free gold, aggregating 525 stamps. Of these the mill of the Alaska Treadwell Gold Mining Company, is said to be the largest in the world, having 240 stamps, 96 concentrators, and 12 ore crushers.

The ore worked by this company is of low grade, but from the convenience of reduction and transportation it has yielded an excellent profit on the investment. Sixty tons of ore from the Silver Creek mine gave an average return of \$200 per ton. The smelting returns show that the lowest grade of ore shipped from the surface workings ran 66 ounces of silver and \$4 in gold to the ton, while the first-class ore gave returns of 341 ounces of silver and \$22 of gold.

Of the other minerals, coal has been taken out in small quantities at nine different places, and thus far is generally of bituminous character and burns freely. The deposits on the mainland have not been explored.

PUBLIC LANDS.

Under the statutes affecting this Territory the Governor states that title to public land can not be acquired except under the mining laws, and this condition of affairs operates to retard very materially the development of the country. There is no encouragement for any one to make improvements of which he has no assurance that he will have the enjoyment. The Governor reports that a few have ventured to make limited improvements upon the public lands with the hope that legislation recognizing claims based upon such expenditures, and settlement

rights, would not be long delayed, and legislation to rectify this state of things is urgently recommended by the Secretary.

The town of Juneau and Douglas City have attained a considerable size, while buildings and improvements by private individuals in other places also manifest the confidence felt that ultimate relief will be afforded. The growth of the towns and the agricultural interests of the country are, however, alike dependent upon future provisions by which title to public land may be secured. The immense value of the territorial exports, the employment of hundreds of vessels in the carrying trade, the business enterprises involving the investment of many millions of dollars, as well as those resources found sufficient to attract and hold enterprising citizens under conditions of uncertainty, all unite in the common plea for more favorable legislation in this direction.

TRANSPORTATION AND POSTAL FACILITIES.

The present report repeats and emphasizes the need of better postal and transportation facilities. The regular and distinctively public lines of transportation in Alaska are limited to the line of the Pacific Coast Steam-ship Company from San Francisco to Southeastern Alaska, and the small steam-tug carrying the mail from Fort Wrangel to Shakan and Klawak. The steamers of the coast line made twenty-nine trips last year, carrying the mails, and usually touching at seven places, and occasionally delivering freight and mails at ten or eleven places. The Klawak steamer touches at three places, making twelve trips, but has a very limited capacity for freight and passengers. The Alaska Commercial Company has accommodated those who desired passage, and has carried mail matter for the convenience of the isolated settlers of the Northwest and the cruisers in Behring Sea and Arctic Ocean.

There are eleven post-offices served with mail within the southeastern district, though some of them at rather infrequent intervals, Sitka, Juneau, Douglas, and Wrangel receiving mails from the States twice a month.

The Governor urges the claim of the Territory to better postal facilities, and bases his argument not only upon the growing business interests of the people, but the necessities of the government in the administration of public affairs.

LEGAL AUTHORITY.

Abundant proof of the great necessity for the establishment of some legal authority in various localities is given by a letter from the special agent in charge of the Alaska division of the Eleventh Census, in which he says that—

Mining camps and fisheries attract during the summer a numerous assemblage of ignorant Italians, Greeks, Portuguese, and Chinese, who are easily led to excesses of various kinds. In four or five such locations shooting and stabbing affrays and

murders have occurred during the past summer, and in every case there was a total failure of justice owing to the absence of magistrates and the impossibility of reaching the court at Sitka.

An evil of another kind can also only be suppressed by the presence of local magistrates; that is, the introduction of the vilest kind of liquor manufactured by the Chinese laborers employed at the canneries. These men bring up their own supplies and in this way can easily introduce any quantity of this pernicious stuff without detection. Nearly all of this liquor passes into the hands of the native laborers and of the worst element among the fishermen. The Chinese peddle this vile beverage openly at \$3 or \$4 a bottle, and so extensive is this trade that the large amount of coin taken up by the various establishments for paying off laborers, amounting to many thousands of dollars, invariably becomes locked up in the hands of the Chinese towards the end of the season.

The gentlemen in charge of these large fishing establishments do their best to suppress the evil, but it is only in rare instances that they succeed in confiscating small quantities of the liquor, which they do not even dare to destroy for fear of strikes on the part of the Chinese employes and injury to their business.

The number of this class of population during the summer season I estimate as follows:

At the canneries of Nuskegak, on Bristol Bay, about 350 whites and over 400 Chinese; at the canneries on the Alaska Peninsula, about 200 whites and 300 Chinese; at Kariak, about 600 white men and nearly 800 Chinese; at the canneries of Cook Inlet, about 150 whites and 200 Chinese; at the Prince William Sound and Copper River canneries, about 150 whites and 200 Chinese.

Very respectfully,

IVAN PETROFF,

Special Agent in Charge of the Alaska Division.

CONDITION OF THE NATIVES.

The Governor's report on the condition of the native population is a very full and interesting paper, embracing much valuable information with respect to the different race-characteristics and customs of the various tribes, as well as those changes in their condition which have been brought about through contact with the white settlers, and closes with a renewal of the former suggestion of Government aid in the establishment of a hospital for the treatment of certain prevalent diseases which threaten the ultimate extinction of the native population.

EDUCATION.

Fourteen Government day schools have been in session during the year, eleven of which were attended exclusively by natives. The work of these schools is reported to be measurably satisfactory, though the attendance is not as full and regular as could be desired, and to remedy this evil the Governor again suggests a mildly compulsory system.

In addition to the above schools the Commissioner of Education has entered into contract for Government assistance of schools under the care of ten different missions.

Twenty-two other schools in connection with missions were maintained without Government aid; seventeen of these schools were under

the mission work of the Græco Russian Church. The Alaska Commercial Company, in accordance with their contract with the Government, maintain schools on St. Paul and St. George's Island, and these with the two homes for children under control of the Presbyterians at Juneau and Howcan, make the total number of schools forty-eight. Several new Government schools are under consideration.

MISSIONS AND CHURCHES.

The Græco-Russian church has been established in Alaska for many years, and has been an active force during the latter part of its existence, especially among the Sitka tribe of Thlinkets and the Aleuts. It has at the present time twelve churches, with resident ordained priests, sixty-seven chapels in charge of unordained assistants, seventeen parish schools, and about twelve hundred members within the Territory.

The mission movement began in 1878, except in the case of the Russian church, and there are now missions maintained by thirteen different denominations. The native Presbyterian church at Sitka numbers about three hundred. The industrial training school has one hundred and seventy students and twenty-one teachers.

The assertion sometimes made that mission work among the Alaskans is not productive of any good result is not borne out by the facts. The Governor says that the improvements in the lives of the children is reflected in a measure by the family, and that the missionaries and teachers can always be relied upon for co-operation in the work of the civil government.

REPRESENTATION IN CONGRESS.

The Governor states that the people exhibit strong feeling upon the subject of having a delegate to represent them in the National Congress, and submits a copy of correspondence between himself and residents of the Territory to show the urgency of the demand.

SUMMARY.

The Governor's report closes with a statement of the more pressing needs of the Territory: his recommendation to remedy which is heartily concurred in by the Secretary.

- (1) Provision for acquiring title to the public lands.
- (2) The adoption of a townsite law.
- (3) The definition of citizenship and qualification of voters as preliminary to future legislation authorizing elections.
- (4) An extension of mail facilities.
- (5) The establishment of hospitals and provision for supporting insane paupers.
- (6) A steam vessel should be furnished for the use of the civil officers in the administration of public business.

YELLOWSTONE NATIONAL PARK.

In the previous portion of this report relating to the public lands, the great importance of protecting the forests was dwelt upon at some length. Those in the Yellowstone National Park are composed in large part of great trees; the area of the woods is far-reaching, 83 per cent. of the 3,400 square miles being timbered, and the head-waters of some of the greatest rivers rise within its borders in the west. The loss of these forests would be disastrous to the vast valley-lands that the rivers irrigate and their preservation is alike necessary for the beauty and grandeur of the park and the safety of the lower valleys.

In regard to this it is necessary to state that during the last year the forest fires were more disastrous, as stated by the Superintendent in his report, than ever before known in the history of the park. Seventy fires occurred. One between the Yellowstone and Shoshone lakes was supposed to have been started by lightning; it became unmanageable and burned itself out. Another started south of the park and burned its way inward; and a third, a disastrous fire, was, it is said, the result of the grossest carelessness, taking a wide range and being controlled only by the greatest labor. The troops are reported to have worked day and night in the extinguishment of these different fires, and have no doubt had a severe experience in such service. There can be no blame for these disasters attached to either the Superintendent or the Department. The force under him is found to have been well trained and faithful, and when the Superintendent was here last spring, in anticipation of the trouble now detailed he was supplied with all he demanded at the time for battling with such conflagrations.

He recommends that to avoid these catastrophes there should be regular camping grounds established where campers should be required to stop, and also that there should be supplied two water tanks and the necessary draught animals for conveying the water to the locality of the fires to extinguish them, as water only can when it gets into the roots of the trees. Since his regular report, the Superintendent has written the Secretary that the last year's experience has been of great value to him in the matter of handling campers, and that all who have come within the park have been thoroughly instructed in the matter of making and extinguishing their fires, and that the park has passed through the ordinary season this year with no fires traceable to them. It should be remembered also that much sentiment is attached by our people to this and other parks, and that they rejoice in the pleasures derived from visits to them and are quick to condemn any severe losses they may there observe.

The rental obtained from such leases as the Secretary is authorized to make and other sources of income produce but a small amount of money to protect this very valuable property, and Congress would do

well, in the Secretary's opinion, to be more liberal in its appropriation. The present system of having a military officer and a company of cavalry detailed to take immediate charge of the park is probably the best, and should be applied to the different parks coming under the control of the Department of the Interior, and the money which would otherwise have to be paid to a civil superintendent could be well turned to the preservation of the woods, the animals, and the feeding-grounds.

WILD ANIMALS.

It is a standing order of the Department that none of the animals or birds in the park shall be killed or destroyed in their haunts. Anyone using fire-traps or other means of destruction, or introducing them into the park, is required to be immediately ejected on proof of his offense. This rule has been almost universally observed, and but few attempts have been made to violate it, the result of which protection has been that the animals and birds have become, it may be said, half tame. The buffaloes, however, break into small bands and seek the fastnesses of the mountains where they multiply, so that in the future large herds may be expected. Had not this park been established at the time it was it is probable that this whole remnant of the vast herds that once covered the plains would have been destroyed, and scarcely a living specimen of the millions of this animal that existed but a short time ago been left in its native range.

The report that a band had left the Park and were being slaughtered on the outside by hunters was immediately followed up and is believed to have been entirely unfounded. Herds of elk are to be seen in the winter, numbering several thousand. During the summer the Park is visited by a great number of these animals. The deer are driven to the highest elevations by the flies, and many thousands of our people leave the Park believing possibly that it has no such herds as really exist, if it possesses even a single specimen. The Superintendent suggests that a band of elk should be, at small expense, fenced in at Sylvan Lake Valley, and a herd of buffalo at Hayden Valley, as a showing of what the Park contains.

It has followed from the total prohibition of the use of fire-arms and the provision of the law that prohibits killing any of the animals there, that the bears and pumas have greatly increased, and as they find their natural prey in the buffalo, elk, and deer, they probably kill some of the calves and fawn. The Secretary has hesitated to order the destruction of the bear and other beasts because of the prohibition contained in the law, and the general demoralization that would take place if hunters were allowed to go through the Park for any purpose whatever. In another year it may be that orders should be given to the Superintendent to use his military force for this purpose, under strict instructions as to the duty to be performed. It is not believed that at present any great harm is being done by having these animals preserved, and

it may be that a number of them could be well disposed of by being transferred alive to the zoological gardens at Washington or elsewhere. It is a subject that will demand consideration when the question really requires solution.

FISH.

Last year the Fish Commission planted 7,000 young trout above the falls in Gardner River, Gibbon River, and Fire Hole River, and, as the Superintendent writes under date of August 31, two ear-loads of trout had been planted in the Shoshone and Lewis Lakes, and another was about to arrive for those waters and the Fire Hole, and it was expected before the close of the season nearly all of the barren waters of the Park would be stocked, and in about three years there would be fine fishing everywhere. As is well known, some of the trout in Yellowstone Park are infested with worms. A very suggestive letter to the Superintendent, Captain Boutelle, U. S. A., has been written on the subject by Prof. Edwin Linton, who visited these waters in connection with Prof. S. A. Forbes during the past summer. Professor Linton makes the suggestion, to which, however, he does not commit himself entirely, but the Secretary begs leave to present it as a very interesting subject of investigation and speculation. It is that the larva infesting the lake-trout is non-sexual and corresponds to the parasitical animal in the common pork tape-worm, and as the sexually mature animals of the same genus as the larva found in the trout infest also the trout-eating pelican which frequents the lake, the animal would die in the fish if it were not allowed to mature in the bird.

In the language of the professor, this larva corresponds to—

The "measles" of pork in the life of the common pork tape-worm, which reaches its adult condition in man. The parasite of the trout belongs to the order of worms that needs two different animals in which to complete the cycle of life. My search, after making some further examination of the trout themselves, was, therefore, for some animal that eats the trout, uncooked, and in which I could find a worm in the intestine, sexually mature, which would correspond with the immature form in the trout. I have examined some of the fish-eating birds that occur on Yellowstone Lake and find good evidence that the pelican is the final host of the parasite which infests the trout. I shall need to make a more careful examination of the material I have collected than is possible with my present appliances before I can publish it as certain that this is the true state of the case.

I may say, however, that I have found an intestinal parasite, sexually mature, with eggs, in the pelican, which belongs to the same genus as the immature form occurring in the trout. Furthermore, collateral evidence alone makes out a very strong case against that bird. I found that the stomachs of the four pelicans I examined contained partly digested remains of fish, evidently average sized trout from the lake. The pelicans were shot on Molly Island, in the southeast finger of the lake, where they have a brooding-place and resort in large numbers. The pelican is the only fish-eating bird I have seen in any numbers on the lake. I am informed that it eats fish that have been left on the shores of the lake. The parasites occur in the same fish often of very different sizes, from a small cyst no larger than a small-sized shot, to larvæ in the muscular tissue a foot in length.

Certainly very strong established scientific data will have to be found before the bird is destroyed to save the fish, and, after all, it may be as difficult a matter to exterminate the pelican, with his wide range of breeding country outside the lake, as it would be to annihilate the fish. It is understood the worm-infested trout is confined to a very limited and well defined region of the waters.

ROADS.

Sixteen miles of new road, principally in Gibbon Canyon, were constructed last year by the Engineer Corps. The appropriation bill for the next year requires the work to be done by contract. The Superintendent suggests that, owing to the rough character of the country, breaks in the roads not to be anticipated by contract are continually occurring requiring repairs, and the work is liable to cost much more than under the present system. He recommends that this should, in preference, be continued, and as it seems a reasonable recommendation it is approved.

There has been a great deal of complaint during the past season as to the management of the transportation in the Park, and, although the Superintendent has expressed a most favorable opinion of Mr. Wakefield's ability to perform this work satisfactorily, the Secretary deems it best to have further investigation made. Mr. Wakefield is at present without authority to act independently in this business, and it is understood that he is not now working for the Park Association. It will be at least necessary for him to take the contract under the conditions and restrictions that are imposed upon all others who do business of any kind there.

The hotels are reported to have been in about the same condition as last year. The Superintendent criticises some of them, no doubt justly; and notice has been sent to the Association that they must bring their hotels into a better condition, and prepare more suitable accommodations for the ensuing season, or the forfeitures of their contracts will be enforced.

The elevator in the canyon spoken of in the Superintendent's report has been prohibited, and will not be erected until further orders.

A bill has been before Congress time and again prescribing just laws for the government of the Park under which those guilty of defacing its wonders, destroying its game, injuring its timber, or otherwise impairing the usefulness and beauty of the reservation would be punished adequately. The bill was carefully scrutinized by the Secretary and many scientific persons interested in the subject, but as it was amended so as to authorize the building of a railroad into the Park, the result was that the act has never passed. There are very strong reasons presenting themselves against the construction of a railroad in a reservation such as this is intended to be, and in the Secretary's last annual

report the subject was discussed, and the conclusion reached was expressed as follows:

So long as this tract of country shall remain a national preserve for science, curiosity, and pleasure, it will of course be an object of cupidity to the covetous, who will see or imagine countless ways in which its exhaustless wonders and treasures can be turned into private advantage, and who will invent many artifices to beguile and circumvent the guardians of this national treasure into granting them footholds of one kind or another, whereby they can make personal gain of this great public benefit. If it is not to be thus frittered away, deprived of its most attractive features, and measurably lost to science and wonder, if not to pleasure, the best and surest way to protect it is to permit no trimming down, no incursions, and no privileges except such as may be deemed absolutely necessary for its protection and regulation, and for the proper accommodation and comfort of visitors.

The passage of the bill that is already before Congress is earnestly recommended, without the provision allowing a railroad to be built therein, and it is further recommended that there be incorporated in the bill a provision for marking more definitely the boundaries of the Park, and that a sufficient appropriation be given therefor.

HOT SPRINGS RESERVATION.

The condition of affairs at the Hot Springs Reservation is peculiar. Many of the leases authorized by Congress have expired, but owing to pending legislation the Secretary has deemed it best to make no new ones until this legislation may mature. The former lessees under contract have become mere tenants at will, and are liable to be removed at any moment, with a forfeiture of their existing improvements. A great evil that has sprung up at this reservation concerns prices and service. A league has been formed, it is thought, and the public is thereby deprived of the free competition that the Government has a right to expect and require. This has arisen from the violation of the provisions of the leases prohibiting assignments without the consent of the Secretary of the Interior. These secret assignments have made it possible for a very few men to control the greater number of bath privileges. Six persons own Old Hale, Horse Shoe, Magnesia, Ramelsberg, and Lamar Springs, with one hundred and thirty-nine tubs, most of them being held illegally.

The old Hale, Independent, Palace, Horse Shoe, Magnesia, Ozark Ramelsberg, and Lamar, with 205 tubs, are now in the "pool," with George G. Latta president and C. W. Fry auditor. The earnings of these houses are pooled and distributed on agreed ratings. The pool is said to have existed since 1883. It is believed that the combination is in violation of the letter and spirit of the law and should not be tolerated. An act is pending in Congress giving the Secretary power of investigation and sufficient authority to crush this evil out, and, in order that the action when taken might bear evenly upon all, the delay mentioned has occurred.

This reservation is in the center of a State, and the inhabitants about it and on it are able to appeal to the State laws and courts for protection against one another. This is liable to lead, as it has already done, to complications with the United States. In a controversy not long since arising between partners, one of whom had a lease for a bath-house, the plaintiff endeavored to have the defendant's interest in this property seized and sold by a receiver in a suit in equity for the settlement of the partnership affairs. Learning of this intended invasion of the public property by the civil authorities of the State, the Secretary anticipated such action by ordering the Superintendent to expel the tenant at will and take immediate possession. This was done, but the Superintendent was arrested by the State authorities. Thereupon the United States district attorney at Little Rock was summoned to take charge of the case, and the State court concluded that it had no jurisdiction in the matter, and rescinded its order.

The property thus thrown upon the hands of the Superintendent was one of the main bath-houses on the reservation, and to have closed it would have caused a great privation to visitors dependent upon it for their "treatment." The Superintendent was therefore authorized to keep the house open and receive the ordinary charges made at the institution previously. The result has been that in the short period of his possession he has obtained over \$2,900, which has been placed as a special deposit subject to the opinion of the Attorney-General as to whether it can be used for the improvement of the reservation or must be turned into the Treasury absolutely. The receiver having been discharged from the equity suit and there being no longer any fear of intervention, the original lessee has been allowed to resume possession on the same terms with others in like condition.

The report of the Superintendent gives all the information that is probably to be expected in regard to this important Government reservation, and in it may be found many facts of interest. He says that it is subdivided into Hot Springs Mountain, North Mountain, Sugar Loaf Mountain, and West Mountain, together constituting the permanent reservation of 900.63 acres, together with 2,019 city lots, 1,270.10 acres in area, and 358.37 acres in streets and alleys. Of the city lots, 1,435 were awarded to individuals, 258 sold and donated, and 326 remaining the property of the United States. The permanent reservation is principally rough, rugged, and precipitous, covered by scraggy timber and underbrush, and without roads, and in most part even without bridle-paths. It is surrounded by a population estimated at 10,000, and it is made the duty of the Superintendent to guard and protect the trees, shrubs, sod, earth, rocks, or anything belonging to the reservation. He asks that he may have the means provided to enable him to perform this duty, and this is earnestly recommended.

The four mountain divisions of the reservations are beautiful sites for natural parks, and might be rendered very attractive with an ap-

appropriation made for the purpose. This was recommended last year, and is now again most strongly advocated. It is discreditable to the Government to have these mountains, fairly within the city limits, and in the presence of all the great hotels, where so many of our citizens resort for health and pleasure, in the condition they now are. The bill pending in Congress gives the Secretary, through the Superintendent, control over the waters of these springs; a control that has long been needed, and without which there must occur the utmost waste and the greatest injustice.

As has been said, several of the largest springs are now under temporary tenancy of a very few individuals, who use and waste hot water, sometimes from bad plumbing and distribution, and partly because the bath-houses are built very close to the springs. The superintendent states that it is his opinion a great mistake was made in the first instance to lease for bath-houses the *sites upon which hot springs are situated*, and recommends that all sites or grounds on which there are hot springs should be preserved from lease or occupancy as the only way to control and protect the waters. This view is no doubt correct and should be enforced. Many of the bath-houses over these springs are now worn out and worthless, and when removed the leases should not be renewed.

The total amount of rents collected was \$13,090.

The expenditures for salaries, repairs, improvements, etc., for the fiscal year were \$5,247.47, leaving a net income to the Government of \$7,842.53.

By a statement furnished by the register's office, it appears that there were, on the 26th of June, 1890, \$9,315.44 standing to the credit of the reservation on the Treasury books.

Attention is also called to the last annual report of the Secretary in regard to this reservation.

In relation to the reservoir now under construction, some discussion has arisen as to whether the waters gathered therein will be as beneficial as if allowed to go to the bath-houses without this arrangement. Congress has already passed upon this subject by ordering the reservoir to be built and making an appropriation therefor. Contracts were duly made for the reservoir, the engine-house, pipes, machinery, and boilers, and all appliances necessary. The plans have been arranged, and the work commenced and will soon be completed. There are 65 springs, some with water at a temperature of 157°. The heat will be maintained in the reservoir to the degree of, probably, not less than 130° Fahrenheit. It is thought the water will thus be altogether unaffected in its remedial qualities, inasmuch as the heat of the water is natural as well when distributed from the reservoir as when received from the pipes leading to the springs directly, and is at a higher degree of heat than can be used in bathing. It has to be cooled by other water in any event

The Secretary has no hesitation in expressing the opinion that it would be far better to proceed with the reservoir and the system already inaugurated than to change at the complaint of a few persons who may find it more to their interests to use particular springs for certain bath-houses than to be put upon that useful level that protects the public interests and by fair competition enables the greatest good to be obtained by the greatest number at these springs. Monopoly should be destroyed. The hot springs are God's gift, and the water should be distributed with as little taxation as possible to the sufferers who resort there. It is a place where the poor as well as the rich in their affliction should be protected by the Government.

THE SEQUOIA NATIONAL PARK.

By act of Congress approved September 25, 1890, the tract of land in the State of California described as township 18 south, and ranges 30 and 31 east, and also sections 31, 32, 33, and 34 in township 17 south, and range 30 east, and by act of Congress approved October 1, 1890, the adjoining tract described as townships 15 and 16 south, ranges 29 and 30 east, and also township 17 south, range 30 east, except above mentioned sections 31, 32, 33, and 34 have been set apart for a public park.

The act provided as follows:

SEC. 2. That said public park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be, as soon as practicable, to make and publish such rules and regulations as he may deem necessary or proper for the care and management of the same. Such regulations shall provide for the preservation from injury of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition. The Secretary may, in his discretion, grant leases for building purposes for terms not exceeding ten years of small parcels of ground not exceeding five acres, at such places in said park as shall require the erection of buildings for the accommodation of visitors; all of the proceeds of said leases and other revenues that may be derived from any source connected with said park to be expended under his direction in the management of the same and the construction of roads and paths therein. He shall provide against the wanton destruction of the fish and game found within said park, and against their capture or destruction for the purpose of merchandise or profit. He shall also cause all persons trespassing upon the same after the passage of this act to be removed therefrom, and, generally, shall be authorized to take all such measures as shall be necessary or proper to fully carry out the objects and purposes of this act.

The park was not given a name by the act, and the Secretary finding it necessary in establishing the required rules and regulations for its government to give a name to the reservation, called it the Sequoia National Park. The reason for thus naming the park is more weighty than that it is the name of the trees, for the trees themselves were called Sequoia by Endlicher in honor of a most distinguished Indian of the half breed, the inventor of the Cherokee alphabet.

Sequoyah, meaning "he guessed it," was the English method of spelling the Indian's name, and in transferring it to the tree the eminent botanist gave it a Latin terminal with substantially the same pronunciation as in English. By designating the park according to the tree the delicate and appropriate honor conferred by the scientist in naming the greatest of America's trees after the most intellectual of the aborigines who dwelt amid our forests, receives a national sanction, and as the towering shaft reared by nature remains a living monument to the fame of the "*Cadmus of America*," it is maintained and protected by our nation's respect and liberality.

The Governor of California, in a letter dated September 24, 1890, which was solicited by the Secretary, states in substance that the greatest difficulty will be in the extinguishment of private rights. No doubt the lands set apart for the park will be found covered with private claims, the annihilation of which will be exceedingly expensive. This cost should be borne by the United States Government, California extending all necessary protection in the way of legislation. The first step should be to procure absolute possession. Then it should be passed to the control of the General Land-Office, with instructions to appoint a forester. The United States district attorney should be notified of trespasses.

No improvements should be permitted by private persons.

It has cost California \$100,000 to extinguish private claims in Yosemite. Letting out leases would inaugurate an extensive class of private claims which would cost \$10,000 to get rid of.

In a resolution of California Academy of Sciences, August 4, 1890, it was stated substantially:

The groves are isolated, at an elevation of 4,000 to 7,000 feet, containing each from a few hundred to a few thousand trees averaging 15 to 20 feet in diameter and 200 feet in height, though some attain 300 feet. There are few less than 10 feet in diameter. One recently found was 41½ feet in diameter, 250 feet high, and had 6,126 annual rings of growth.

The preservation of these forests is of national importance on account of their influence on climate and water-fall. The Sequoia are rapidly dying out, as but few young trees are seen outside of the old groves.

Their destruction is useless, wasteful, and lamentable. At the mills millions and millions of feet of lumber are decaying upon the ground.

Trees 30 and 40 feet in diameter have been cut for curiosity's sake alone. The stump of the greatest of all, the Centennial tree, should be covered in with metal roofing; in this way it may be preserved one thousand years.

Simply withdrawing these lands from sale will not preserve the groves. A National Park well guarded and managed should be set off covering these groves.

The recommendations go further. The paper, with one from Mr. Frank J. Walker, is annexed to this report, as are also the rules established by the Secretary. (Appendix E.)

THE GENERAL GRANT NATIONAL PARK.

By act of Congress approved October 1, 1890, the tract of land in the State of California described as sections 5 and 6, in township 14 south, range 28 east of Mount Diablo meridian, and also sections 31 and 32 of township 13 south, range 28 east of the same meridian, were set apart for a public park. It was provided by the act in regard to this park the same as in the act establishing the Sequoia Park, as to its *mutatis mutandis*. The rules and regulations adopted by the Secretary were also the same in general effect.

The name "General Grant National Park" was adopted for the park by the Secretary, because this name had become, by common consent, that of the largest tree there, and which it is understood is among the greatest if not itself the very greatest of the "*Sequoia gigantea*." The propriety of adopting the name needs no explanation or defense. The people have already baptized the tree with the name of our great and noble general, and the park could not consistently be called aught else, unless it were "The Union."

THE YOSEMITE NATIONAL PARK.

By act of Congress approved October 1, 1890, the tract of land in the State of California described as townships 1 and 2 north, and townships 1, 2, 3, and 4 south, all of ranges 19, 20, 21, 22, 23, and 24 east; also townships 1, 2, 3, and 4 south, of range 25 east; and also townships 3 and 4 south, of range 26 east, excepting therefrom that tract of land known as Yosemite Valley, granted to the State of California for a public park by act of Congress approved June 30, 1864.

The provisions of law and the rules and regulations adopted by the Secretary were in substance the same as those provided for the Sequoia National Park.

This reservation surrounds the Yosemite Valley; hence its name. It embraces over a million acres, and will need much attention and care to preserve it.

It is to be remarked that not one of these park laws has made any appropriation with which to carry its provisions into effect, and the Department has no means to spare for the purpose.

Whether the parks shall be put under charge of civil custodians or a military cavalry guard shall be sent to each is a subject now being considered and investigated.

Every effort will be made with the means at hand to preserve the trees and natural beauties of these very remarkable and very extensive

tracts of land, and to expel trespassers and punish those violating the law or the rules; but Congress must make an appropriation, or the Secretary of the Interior will be left with a gigantic responsibility and only dwarfed resources to meet it. The parks have already gained the favor of our people, and there would be probably no criticism of a reasonable expenditure to support them.

NICARAGUAN CANAL.

The first annual report of the Maritime Canal Company of Nicaragua was submitted to the Secretary of the Interior in December, 1889, as required by the act of Congress approved February 20, 1889, incorporating the company. It appears therefrom that at a meeting of the incorporators, held in the city of New York March 7, 1889, the charter granted by Congress was unanimously accepted. After due publication books were opened for subscriptions to the capital stock, and 10,145 shares were subscribed for, at par, amounting in the aggregate to \$1,014,500, of which amount \$601,450 were paid into the treasury of the company in cash. The other assets of the company consist, at the date of the report, of property rights, privileges and franchises owned by it in Nicaragua and New York.

The plan of the work as outlined is—

The construction of a breakwater at or near Greytown, on the Caribbean Sea, and dredging thence to the westward 19 miles through alluvial ground to the place where a lock of 31 feet lift will be built. At 2 miles beyond will be constructed a second lock or double lock of the combined lift of 75 feet, and a dam across the small stream Deseado, above which will be a basin affording $4\frac{1}{2}$ miles of free navigation; then a rock-cut about 21 miles in length, followed by 12 miles of free navigation in the valleys of two small rivers, the San Francisco and the Machado. Here the waters will be raised by dams and embankments, so as to form basins, which will connect directly with the San Juan River, above a large dam to be built across that river. Said dam will raise the waters in the river and lake, and secure additional free navigation of 64 miles in the river and $56\frac{1}{2}$ miles across the lake.

On the western side of the lake the canal will enter a cut of slight depth in the earth and rock of 9 miles in length, issuing thence into the Tola basin, with $5\frac{1}{2}$ miles of free navigation, which will be obtained by damming the Rio Grande. At this dam a series of locks will lower the level 85 feet, and the canal will proceed in excavation down the valley of the Rio Grande a distance of 2 miles to the last lock, a tidal lock of 20 to 30 feet lift, below which the canal will enter the upper portion of the harbor of Brito, $1\frac{1}{2}$ miles from the Pacific.

On the 3d day of June, 1889, preliminary work of construction began at Greytown, and on the 8th of October the work of excavation was commenced. The government of the Republic of Nicaragua has officially recognized and declared by decree the commencement of construction of the canal in accordance with the terms of the concession.

The company has established permanent headquarters at Greytown, erected store-houses, hospitals, dwellings, and other buildings, constructed several miles of aqueduct, cleared parts of the San Juan and

Deseado Rivers, built several miles of broad-gauge railroad and 35 miles of telegraph line, and cleared the first part of the route of the canal. A large quantity of machinery, tools, lumber, piles, and other materials necessary for the establishment of the plant to be used in construction, has been landed at Greytown. A complete hospital service and ambulance corps has been organized in Nicaragua and sanitary arrangements in and about camps and headquarters have been perfected.

The work and statistics will appear in the report for the present year, to be made to the next session of Congress.

JOHN W. NOBLE,
Secretary.

To the PRESIDENT.

PAPERS
ACCOMPANYING
REPORT OF SECRETARY OF THE INTERIOR

APPENDIX C.

POPULATION OF THE UNITED STATES BY STATES AND TERRITORIES,
1890.

DEPARTMENT OF THE INTERIOR,
CENSUS OFFICE,
Washington, D. C., October 28, 1890.

SIR: I have the honor to submit herewith a statement showing the population of the United States according to the Eleventh Census. The large clerical force and improved methods have allowed a very rapid progress in the compilation and tabulation of results, and this report will be followed within a short time by other bulletins relating to the population. The special work of the census is so far advanced that bulletins relating thereto will now be issued at frequent intervals during the next few months. The field-work of the census is nearing completion, and by the end of this year will be practically finished. The work of tabulation is being rapidly pressed forward, in order to begin the publication of the volumes as soon as possible.

The population of the United States on June 1, 1890, as shown by the first count of persons and families, exclusive of white persons in Indian Territory, Indians on reservations, and Alaska, was 62,480,340. These figures may be slightly changed by later and more exact compilations, but such changes will not be material. In 1880 the population was 50,155,793. The absolute increase of the population in the ten years intervening was 12,324,557, and the percentage of increase was 24.57. In 1870 the population was stated as 38,558,371. According to these figures the absolute increase in the decade between 1870 and 1880 was 11,597,412, and the percentage of increase was 30.08.

Upon their face these figures show that the population has increased between 1860 and 1890 only 727,345 more than between 1870 and 1880, while the rate of increase has apparently diminished from 30.08 to 24.57 per cent. If these figures were derived from correct data, they would be indeed disappointing. Such a reduction in the rate of increase in the face of the enormous immigration during the past ten years would argue a great diminution in the fecundity of the population or a corresponding increase in its death rate. These figures are, however, easily explained when the character of the data used is understood. It is well known, the fact having been demonstrated by extensive and thorough investigation, that the census of 1870 was grossly deficient in the Southern States, so much so as not only to give an exaggerated rate of increase of the population between 1870 and 1880 in these States, but to affect very materially the rate of increase in the country at large.

These omissions were not the fault nor were they within the control of the Census Office. The census of 1870 was taken under the law which the Superintendent, General Francis A. Walker, characterized as "clumsy, antiquated, and barbarous." The Census Office had no power over its enumerators save a barren protest, and this right was even questioned in some quarters. In referring to these omissions the Superintendent of the Tenth Census said in his report in relation to the taking of the census in South Carolina: "It follows, as a conclusion of the highest authority, either that the census of 1870 was grossly defective in regard to the whole of the State or some considerable parts thereof, or else that the census of 1880 was fraudulent." Those, therefore, who believe in the accuracy and honesty of the Tenth Census—and that was thoroughly established—must accept the other alternative offered by General Walker, namely, that the Ninth Census was "grossly defective." What was true of South Carolina was also true, in greater or less degree, of all the Southern States.

There is, of course, no means of ascertaining accurately the extent of these omissions, but in all probability they amounted to not less than 1,500,000. There is but little question that the population of the United States in 1870 was at least 40,000,000, instead of 38,558,371, as stated. If this estimate of the extent of the omissions in 1870 be correct, the absolute increase between 1870 and 1880 was only about 10,000,000, and the rate of increase was not far from 25 per cent. These figures compare much more reasonably with similar deductions from the population in 1880 and 1890.

Omitting from consideration those States in which the census of 1870 is known or is presumed to have been faulty, the rate of increase between 1870 and 1880 in the remaining States has been very nearly maintained in the decade between 1880 and 1890. Referring to the principal table of the bulletin, the census of 1870 is known or is presumed to have been deficient in nearly all the States of the South Atlantic and Southern Central divisions, while in the North Atlantic, Northern Central, and Western divisions no evidence of incompleteness has been detected.

The population of these three last-named divisions in 1870, 1880, and 1890, the absolute increase for the two decades, and the rate of increase, is set forth in the following table:

Year.	Population.	Increase in population.	Percentage of increase.
1870	26, 270, 351		
1880	33, 639, 215	7, 368, 864	28.1
1890	42, 693, 682	9, 054, 467	26.9

It will be seen that the absolute increase between 1880 and 1890 exceeded that between 1870 and 1880 by 1,685,603, and that the proportional increase was but 1.2 per cent. less.

Population of the United States in 1890, as compared with 1880 and 1870, by States and Territories, showing the increase by number and percentages from 1880 to 1890, from 1870 to 1880, and from 1860 to 1870.

[The figures for 1890 in this table are not final, but are subject to revision.]

States and Territories.	Population.			Increase from 1880 to 1890.		Increase from 1870 to 1880.		Increase from 1860 to 1870.	
	1890.	1880.	1870.	Number.	Per-cent-age.	Number.	Per-cent-age.	Number.	Per-cent-age.
The United States	62, 480, 540	50, 155, 783	38, 558, 371	12, 324, 757	24. 57	11, 597, 412	30. 08	7, 115, 050	22. 63
North Atlantic division	17, 364, 429	14, 507, 407	12, 208, 730	2, 857, 022	19. 69	2, 208, 677	17. 06	1, 704, 462	16. 09
Maine	600, 261	618, 936	626, 915	11, 325	1. 75	22, 021	3. 51	21, 364	20. 22
New Hampshire	375, 827	346, 041	318, 300	28, 836	8. 31	28, 691	9. 01	27, 773	22. 38
Vermont	332, 205	332, 286	330, 551	281	0. 08	1, 735	0. 52	15, 453	4. 90
Massachusetts	2, 233, 407	1, 783, 045	1, 457, 351	450, 322	25. 26	325, 734	22. 35	226, 285	18. 38
Rhode Island	345, 345	276, 531	217, 353	68, 812	24. 86	59, 178	27. 23	42, 733	24. 47
Connecticut	745, 861	622, 700	537, 454	123, 161	19. 78	85, 246	15. 86	77, 307	16. 80
New York	5, 981, 934	5, 082, 871	4, 382, 759	899, 063	17. 69	700, 112	15. 97	502, 034	12. 94
New Jersey	1, 441, 017	1, 191, 116	906, 096	309, 901	27. 40	225, 020	24. 83	234, 061	34. 83
Pennsylvania	5, 248, 574	4, 282, 891	3, 521, 951	965, 683	22. 55	700, 940	21. 61	615, 736	21. 19
South Atlantic Division	8, 836, 759	7, 597, 197	5, 853, 610	1, 230, 562	16. 32	1, 743, 587	29. 79	488, 907	9. 11
Delaware	167, 871	146, 608	125, 015	21, 263	14. 50	21, 593	17. 27	12, 799	11. 41
Maryland	1, 010, 431	934, 943	780, 834	105, 488	11. 28	154, 049	19. 73	93, 845	13. 66
District of Columbia	220, 796	177, 634	131, 700	52, 172	29. 37	45, 924	34. 87	56, 620	75. 41
Virginia	1, 648, 911	1, 512, 565	1, 225, 103	136, 346	9. 01	287, 402	23. 46	670, 839	64. 44
West Virginia	760, 448	618, 457	442, 014	141, 991	22. 96	176, 443	39. 92		
North Carolina	1, 617, 340	1, 399, 750	1, 071, 361	217, 590	15. 34	228, 889	39. 65	78, 739	7. 93
South Carolina	1, 147, 161	995, 577	705, 606	151, 584	15. 23	280, 971	41. 10	1, 898	0. 27
Georgia	1, 824, 366	1, 542, 180	1, 184, 109	292, 186	18. 95	358, 071	30. 24	126, 823	12. 00
Florida	390, 435	269, 493	187, 748	120, 942	44. 88	81, 745	43. 54	47, 324	33. 70

a Decrease.

b Of Virginia and West Virginia together.

Population of the United States in 1890, as compared with 1850 and 1870, &c.—Continued.

States and Territories.	Population.			Increase from 1850 to 1890.		Increase from 1870 to 1890.		Increase from 1850 to 1870.	
	1850.	1880.	1870.	Number.	Per-cent- age.	Number.	Per-cent- age.	Number.	Per-cent- age.
Northern Central division	22,322,151	17,364,111	12,983,411	4,058,040	23.55	4,382,000	23.76	2,384,740	12.32
Ohio.....	3,008,719	3,198,062	2,065,290	408,057	14.65	532,692	19.99	325,749	15.91
Indiana.....	2,189,093	1,978,291	1,080,637	216,729	10.63	297,064	17.71	239,239	24.43
Illinois.....	3,518,536	3,077,871	2,529,891	748,065	24.06	537,980	21.18	827,943	32.36
Michigan.....	2,683,793	1,630,957	1,184,656	453,855	27.65	452,878	38.25	424,947	35.86
Wisconsin.....	1,681,697	1,318,497	1,054,610	364,209	27.99	269,827	24.73	329,789	32.69
Minnesota.....	1,309,017	780,773	459,706	519,244	66.50	341,067	77.57	797,689	185.61
Iowa.....	1,008,739	1,014,615	1,194,020	382,114	17.36	450,300	36.66	518,189	76.91
Missouri.....	2,677,686	2,168,220	1,721,205	588,700	23.46	447,083	25.07	539,289	45.92
North Dakota.....	189,435	30,969	14,181	145,516	204.39	120,996	853.29	9,344	103.19
South Dakota.....	337,844	66,268	14,181	229,569	241.63	120,996	853.29	9,344	103.19
Nebraska.....	1,056,793	492,492	122,093	694,391	133.09	329,499	267.59	94,132	222.45
Kansas.....	1,422,458	396,030	204,390	427,383	42.91	641,697	173.35	237,183	123.91
Southern Central division	10,948,253	8,919,371	6,434,410	2,028,419	22.75	2,484,901	38.62	695,722	11.34
Kentucky.....	1,833,436	1,618,690	1,321,011	206,748	12.34	377,670	24.81	165,397	14.91
Tennessee.....	1,763,729	1,544,369	1,258,550	291,364	14.35	363,820	21.55	148,719	13.91
Alabama.....	1,569,673	1,262,665	966,992	245,568	19.45	295,518	26.69	37,961	4.07
Mississippi.....	1,294,867	1,131,367	827,922	153,296	13.55	302,675	36.68	30,617	4.63
Louisiana.....	1,318,828	939,916	726,915	176,882	18.82	213,031	29.31	16,391	2.97
Texas.....	2,582,220	1,501,749	818,750	646,471	40.24	773,179	94.45	214,284	35.48
Indian Territory (a)	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oklahoma.....	661,701	.....	.....	61,701	.....	.....	.....	.....	.....
Arkansas.....	1,123,385	802,523	484,471	322,869	46.23	318,054	65.65	49,921	11.38
Western division	3,008,948	1,787,697	990,510	1,241,251	70.22	777,187	78.40	371,534	69.92
Montana.....	181,769	20,759	20,595	92,610	236.50	18,564	90.14	20,395	.....
Wyoming.....	60,289	20,789	9,118	39,899	131.45	11,071	128.00	9,118	.....
Colorado.....	410,075	194,327	30,864	216,648	111.40	154,469	87.47	5,867	16.20
New Mexico.....	144,862	119,865	91,874	25,297	21.16	27,091	30.14	61,642	61.70
Arizona.....	59,691	40,440	9,658	13,291	47.60	38,792	118.72	9,658	.....
Utah.....	208,498	143,003	80,786	67,335	43.44	57,177	65.88	40,513	115.40
Nevada.....	44,327	62,206	62,491	217,309	28.41	19,775	46.54	35,634	519.67
Idaho.....	81,220	35,610	14,999	51,019	158.29	17,011	117.11	14,999	.....
Alaska (d)	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington.....	545,510	75,116	23,955	274,460	365.30	51,161	213.57	12,361	106.62
Oregon.....	312,490	174,768	90,920	187,720	78.80	83,845	92.22	38,458	75.30
California.....	1,204,062	804,034	560,247	830,308	30.34	304,447	54.34	180,269	47.44

a The number of white persons in the Indian Territory is not included in this table, as the census of Indians and other persons on Indian reservations, which was made a subject of special investigation by law, has not yet been completed.

b Including 9,367 persons in Graceland county (in Indian Territory), claimed by Texas.

c Decrease.

d The number of white persons in Alaska is not included in this table, as the census of Alaska, which was made a subject of special investigation by law, has not yet been completed.

RECAPITULATION BY GROUPS.

Geographical divisions.	Population.			Increase from 1850 to 1890.		Increase from 1870 to 1890.		Increase from 1850 to 1870.	
	1850.	1880.	1870.	Number.	Per-cent- age.	Number.	Per-cent- age.	Number.	Per-cent- age.
The United States	62,480,540	60,155,783	38,658,571	12,324,737	24.57	11,697,412	30.08	7,119,650	22.43
North Atlantic division.....	17,364,420	14,507,407	12,208,730	2,857,022	19.69	2,208,677	17.90	1,704,452	18.09
South Atlantic division.....	8,896,750	7,597,197	5,853,610	1,239,562	16.32	1,734,587	29.79	688,907	9.11
Northern Central division.....	22,322,151	17,364,111	12,983,411	4,058,040	28.52	4,382,000	23.76	2,384,740	12.70
Southern Central division.....	10,948,253	8,919,371	6,434,410	2,028,419	22.75	2,484,901	38.62	695,722	11.34
Western division.....	3,008,948	1,787,697	990,510	1,241,251	70.22	777,187	78.40	371,534	69.92

The general law governing the increase of population is, that when not disturbed by extraneous causes, such as wars, pestilences, immigration, emigration, etc., increase of population goes on at a continually diminishing rate. The operation of this law in this country has been interfered with in recent years by the late war, which, besides the destruction of a vast number of lives, decreased the birth rate very materially during its progress. It was followed by an increased birth rate, as is invariably the case under similar circumstances. The normal rate of increase has been, and is, greatly interfered with also by immigration, and it is difficult to estimate the effect of this upon our rate of increase. Approximation to it may, however, be reached by the following process: Between 1880 and 1890, 5,246,613 immigrants entered this country. Of these a part have returned to their homes or migrated elsewhere. A considerable proportion, probably about one-eighth, have died. On the other hand, children have been born to them, and it is probable that the births have counterbalanced the deaths and the emigration, so that the net influence which immigration has exerted upon our population is approximately expressed by the number of immigrants. Subtracting this number from the numerical increase during the past decade, there remains a trifle over 7,000,000 to represent the actual increase of the inhabitants of this country in 1890. The rate of natural increase is therefore not far from 14 per cent.

Similar calculations for the population in 1890 and the decade preceding would, of course, be valueless on account of the imperfections of the census of 1870.

The table herewith submitted shows the population by States and Territories in 1890, 1880, and 1870, the numerical increase in each State between 1860 and 1870, between 1870 and 1880, and between 1880 and 1890, and the corresponding percentages of increase. This table, which gives the population only at ten-year intervals, is supplemented in the case of a few States by the following table, in which is given, in addition to the result of the Federal censuses of 1880 and 1890, the result of State censuses taken, with the exception of Michigan, in 1885, the census of that State having been taken in 1884. Comparing the results of these State censuses with those of the Federal censuses, it must be understood that the State censuses were taken under different authority, by different machinery, and by different methods from those employed in the Federal census.

States.	Population.			Increase.		Percentage of increase.	
	1890.	1885.	1880.	1880 to 1885.	1885 to 1890.	1880 to 1885.	1885 to 1890.
Colorado	410, 975	243, 010	194, 327	49, 583	167, 065	25. 5	62. 5
Dakota	510, 273	415, 610	135, 177	280, 433	94, 663	207. 5	22. 8
Florida	390, 435	342, 551	269, 493	73, 058	47, 884	27. 1	14. 0
Iowa	1, 906, 729	1, 753, 980	1, 624, 615	129, 365	152, 740	8. 0	8. 7
Kansas	1, 423, 485	1, 268, 530	996, 096	272, 434	154, 955	27. 4	12. 2
Massachusetts	2, 233, 407	1, 942, 141	1, 783, 065	159, 050	291, 266	8. 0	15. 0
Michigan	2, 068, 792	1, 853, 858	1, 636, 937	216, 721	236, 134	13. 2	12. 7
Minnesota	1, 306, 017	1, 117, 798	780, 773	337, 025	182, 219	43. 2	16. 3
Nebraska	1, 056, 793	740, 645	452, 402	288, 243	316, 148	63. 7	42. 7
New Jersey	1, 441, 017	1, 278, 033	1, 131, 110	146, 917	102, 984	13. 0	12. 8
New Mexico	144, 862	134, 141	119, 565	14, 576	10, 721	12. 2	8. 0
Oregon	312, 490	194, 150	174, 768	19, 382	118, 340	11. 1	61. 0
Rhode Island	345, 343	304, 284	276, 531	27, 753	41, 059	10. 0	13. 5
Washington	340, 516	129, 438	75, 116	54, 322	220, 078	72. 3	170. 0
Wisconsin	1, 683, 697	1, 563, 423	1, 315, 497	247, 926	120, 274	18. 8	7. 7

In the State of Kansas the course of the population can be traced even more closely than in the other States represented in the above table. Since 1885 this State has taken a census each year, the results of which are shown in the accompanying table, together with the Federal censuses of 1880 and 1890:

1880. Federal census	996, 096
1885. State census	1, 268, 530
1886. State census	1, 406, 738
1887. State census	1, 514, 578
1888. State census	1, 518, 552
1889. State census	1, 464, 914
1890. Federal census	1, 423, 485

In the principal table of this bulletin the States are grouped as North Atlantic, South Atlantic, Northern Central, Southern Central, and Western. This grouping is a natural one, and by the aid of it certain characteristic features in the development of the States are brought out. The North Atlantic section is primarily a manufacturing section. As a necessary result of the predominance of manufacturing there

is a great development of urban population. Indeed, more than one-half the inhabitants are grouped in cities.

The predominant industry of the Northern Central States is agriculture, although in many of these States manufactures are now acquiring prominence. The industries of the South Atlantic and Southern Central sections are still almost entirely agricultural, while in the Western States and Territories the leading industries are agriculture, mining, and grazing.

In the course of the settlement and development of a country the industries commonly follow one another in a certain order. After the hunter, trapper, and prospector, who are commonly the pioneers, the herdsmen follow, and for a time the raising of cattle is the leading industry. As settlement becomes less sparse this is followed by agriculture, which in its turn, as the population becomes more dense, is succeeded by manufactures, and, as a consequence, the aggregation of the people in cities. We see in this country all stages of this progress.

In Maine, New Hampshire, and Vermont the rate of increase between 1870 and 1880 has not quite been maintained; indeed, in the last-named State there has been a trifling absolute decrease of population. In these States agriculture is in a very low condition, the soil is, as a rule, infertile, and markets are not especially easy of access; consequently the farming population has continued to migrate to the Far West. On the other hand, manufactures have not yet assumed sufficient prominence to retain population.

In the other States of this subdivision, with the exception of Rhode Island, viz., Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania, while farming is at quite as low an ebb as in Maine, New Hampshire, and Vermont, manufactures have assumed so great prominence that they have not only sufficed to maintain the former rate of increase, but even to increase it. The rate in Massachusetts has increased from 22 to 25 per cent., in Connecticut from 16 to 20, in New York from 16 to 18, in New Jersey from 25 to 27, and in Pennsylvania from 22 to 23. It will be seen, furthermore, that this augmentation of the rate of increase is greater in the more Easterly States than in the three Western ones above mentioned, owing to the fuller development of manufacturing industries.

Turning to the table showing the results of the State censuses, it appears that during the first half of the last decade the rate of increase in Massachusetts was below the average of the decade, while in the last half it was much greater, a fact which indicates either that the rate of increase declined materially in the first half of the decade, or that the State enumeration was much less complete than that of the Federal enumeration in 1890. The case is somewhat similar in Rhode Island, although not in so marked a degree, the rates of increase between 1880 and 1885 and between 1885 and 1890 being respectively 10 and 13.5 per cent. In New Jersey the rate of increase seems to have been maintained quite uniformly throughout the decade.

In the Northern Central group of States various conditions prevail. In Ohio, Indiana, Iowa, and Missouri, and in Illinois, if the city of Chicago be dropped from consideration, the rate of increase has declined very decidedly. In Ohio it has fallen from 20 to 15 per cent.; in Indiana from 18 to 11; in Iowa from 36 to 17; in Missouri from 26 to 23 per cent., in spite of the rapid growth of St. Louis and Kansas City; and in Illinois, dropping Chicago from consideration, from 14.9 to 5.6 per cent. In these States the agricultural industry, which is still the prominent one, has begun to decline, owing to the sharp competition of Western farms. The farming population has migrated westward, and the growth of manufactures is not yet sufficiently rapid to repair these losses. The southern portions of Michigan, Wisconsin, and Minnesota are under similar conditions, but the northern parts of these States, lying upon the frontier of settlement, have filled up with sufficient rapidity to repair either wholly or in part the losses of the southern parts. Michigan increased at the rate of 38 per cent. between 1870 and 1880, while between 1880 and 1890 the rate was but 28 per cent. The increase between 1880 and 1890 was cut into unequal parts by the State census taken in 1884. In the first four years of the decade the increase was 13.2 per cent., while in the last six years it was 12.7 per cent. As the rate of increase in this State is declining, the State census taken in 1884 corroborates the Federal census of 1890. In Wisconsin the last decade shows an increase of 28 per cent., as against an increase of 25 per cent. in the decade between 1870 and 1880. The State census of Wisconsin, taken in 1885, cuts the decade into two equal parts, and shows an increase during the first half of 18.8 per cent. and during the second half of but 7.7 per cent.

Minnesota increased 78 per cent. between 1870 and 1880 and 67 per cent. between 1880 and 1890, the numerical increase being over half a million in the past decade. The State census, taken in 1885, shows that the bulk of this increase occurred between 1880 and 1885. The numerical increase during the first five years was 337,025, and the rate of increase 43 per cent., while during the last half of the decade the numerical increase was 122,219, and the rate of increase 16.3 per cent.

During the past ten years the population of Dakota, considering the two States of North Dakota and South Dakota together, has increased from 135,177 to 510,273, or 277 per cent.; Nebraska from 452,402 to 1,056,793, or 134 per cent., and Kansas from 996,096 to 1,423,485, or 43 per cent. This increase has not, however, continued uniformly throughout the decade. In 1885 Dakota contained 415,610 inhabitants, or more than four-fifths of its present population. Nebraska contained 740,645 inhabitants in the same year, thus dividing the numerical increase quite equally between the two halves of the decade, but leaving the greater percentage of increase in the first half. In the same year Kansas by its State census had 1,268,530 inhabitants, showing that nearly two-thirds of the numerical gain was acquired during the first half of the decade. The industries of these States are almost purely agricultural, and are dependent on the supply of moisture, either in the form of rain or by irrigation. Through these States passes what is known as the subhumid belt, a strip of country several degrees in width, in which during rainy years there is an abundance of moisture for the needs of crops, while in the years when the rain-fall is below the average the supply is deficient. In this region little provision has been made for artificial irrigation, the settlers having thus far been content to depend upon rain-fall. Into this region the settlers flocked in large numbers in the early years of the decade, drawn thither by the fertility of the land and by the fact that for a few years the rain-fall had been sufficient for the needs of agriculture. During the past two or three years, however, the conditions of rain-fall have materially changed. It has fallen decidedly below the normal, and the settlers have thereby been forced to emigrate. Thousands of families have abandoned this region and gone to Oklahoma and the Rocky Mountain region. This migration is well shown in the progress of Kansas, as indicated by its annual censuses. These censuses show a rapid increase in population from 1880 up to 1887; 1888 shows but a slight increase over 1887, while 1889 shows a reduction in the population, leading up to the further reduction shown by the Federal census in 1890.

Throughout the South Atlantic and Southern Central States the rate of increase has diminished, and in most of these States it has diminished very materially. A certain reduction in the percentage of increase, especially in the eastern part of this region, was to be expected, due not only to the operation of general laws, but also to the fact that there has been considerable migration from the States east of the Mississippi River to the westward and but little immigration. Taken together, however, these two causes by no means account for the reduction in the rate of increase in these States. The real cause is to be found, as was stated early in this discussion, in the imperfections of the census of 1870. These imperfections resulted in giving a comparatively low rate of increase between 1860 and 1870 and an exaggerated increase between 1870 and 1880. The following table, showing the rates of increase during the last three decades in these States, illustrates the imperfections of the census of 1870 in a somewhat startling manner:

States.	Per cent. of increase.		
	1860 to 1870.	1870 to 1880.	1880 to 1890.
Virginia.....	4.4	23.5	9.0
North Carolina.....	7.9	30.6	15.5
South Carolina.....	0.3	41.1	15.2
Georgia.....	12.0	30.2	18.9
Alabama.....	3.4	26.6	19.4
Mississippi.....	4.6	36.7	13.5
Louisiana.....	2.7	29.3	18.8
Kentucky.....	14.3	24.8	12.5
Tennessee.....	13.4	22.5	14.4

a Of Virginia and West Virginia together.

It is but reasonable to suppose that in those States, which were ravaged by war from 1861 to 1865, the rate of interest in the decade which includes the war period should be less than a normal one. Of all these States Virginia, whose soil was the principal theater of the war, must have suffered most severely, and during the period in question it increased at the rate of but 4.4 per cent. Next to Virginia Kentucky and Tennessee suffered the most severely, and yet they increased, respectively, 14 and 13 per cent. On the other hand, North Carolina, which suffered less severely, gained but 8 per cent., and South Carolina, which suffered less in comparison with Virginia, apparently remained at a standstill as regards population. Georgia gained 12 per cent., while Alabama and Louisiana gained but 3 per cent. and Mississippi but 5, although they were comparatively remote from active operations and suffered relatively little from the ravages of war. On the other hand, those States which suffered the most severely from the war have made during the decade between 1870 and

1880 the smallest proportion of gain of the Southern States, whereas the reverse should have been the case. Thus Virginia gained 23 per cent., Kentucky 25, and Tennessee 21, while the States that were farther removed from active operations were North Carolina, which gained 31; South Carolina, 41; Georgia, 30; Alabama, 27; Mississippi, 37, and Louisiana, 29 per cent. These startling discrepancies can be due only to the imperfections of the censuses of 1870, which were, as has been demonstrated, greatest in South Carolina, Mississippi, Louisiana, Alabama, Georgia, and North Carolina, although they were not by any means wanting in Virginia, Kentucky, and Tennessee.

The industries of these two sections are almost purely agricultural. During the past ten years manufactures have obtained a slight footing and mining has made considerable growth in the mountain regions, but these causes have thus far produced but a comparatively trifling movement of population. The urban population, although great in proportion to that which existed formerly, is very small in proportion to the rural population of the region.

During the first half of the last decade Florida had a rapid growth. The population between 1880 and 1885 increased 73,068, or at the rate of 27 per cent. This rapid growth, however, received a serious check in 1887 and 1888 by an epidemic of yellow fever and by severe frosts. The growth since 1885 has, therefore, been comparatively slow.

Arkansas has continued to grow at a rapid rate, having increased 40 per cent. in the last ten years. Texas also has increased with great rapidity, the numerical increase of its population being 640,471, or over 40 per cent.

In the western section the conditions of growth have been very varied. In the earlier years of the decade the discovery of valuable silver and copper mines in the mountains of Montana in the neighborhood of Butte have drawn to that State a large immigration, which is engaged not only in mining, but in developing the rich agricultural resources. Wyoming has continued to grow with accelerated rapidity.

The census of Colorado in 1880 was taken on the top wave of a mining excitement, which had filled its mountains with miners, prospectors, and speculators, increasing its population enormously, especially in the mountainous country. The census of the State taken in 1885 was, on a superficial view, very surprising. It showed that most of the mining counties had lost population during the five years preceding. This loss was, however, more than made up by the growth of its cities and its agricultural counties. The census of 1890 shows still further reduction of population in the mining regions of the State and an extraordinary development of its urban population and its farming element. New Mexico, Arizona, and Utah show rates of increase which are small when the sparsely settled condition of these Territories is considered, while Nevada shows an absolute diminution of population of 17,939, or nearly 29 per cent., leaving it the smallest of all the States. This condition of things is a natural result of the failure of the Comstock and other mines, work upon which has practically ceased. Idaho has increased its population two and a half times. Its prosperity is mainly due to its mines, although people are now turning to agriculture in considerable numbers.

The growth of Washington has been phenomenal, the population in 1890 being nearly five times that of 1880. As is shown by the State census taken in 1885, this growth has been almost entirely during the last five years of the decade. The inducements which have attracted settlers are in the main its fertile soil and ample rain-fall, which enable farming to be carried on without irrigation over almost the entire State. The growth of Oregon, though less rapid, has been at a rate of nearly 80 per cent. during the past decade. The numerical increase has been 137,722, of which over four fifths has been acquired during the past five years. The additions to its population are mainly in the valleys of the Columbia and Willamette rivers.

California, which increased 54 per cent. during the decade between 1870 and 1880, has maintained during the past decade a rate of increase of 39 per cent. This increase, though wide-spread throughout the State, has been most marked in its great cities and in the southern part.

The following table shows the relative rank in population of the States and Territories in 1800 and in 1880:

Relative rank of States and Territories in population.

1890.	1880.	1890.	1880.
1 New York.	1 New York.	26 Nebraska.	26 Minnesota.
2 Pennsylvania.	2 Pennsylvania.	27 Maryland.	27 Maine.
3 Illinois.	3 Ohio.	28 West Virginia.	28 Connecticut.
4 Ohio.	4 Illinois.	29 Connecticut.	29 West Virginia.
5 Missouri.	5 Missouri.	30 Maine.	30 Nebraska.
6 Massachusetts.	6 Indiana.	31 Colorado.	31 New Hampshire.
7 Texas.	7 Massachusetts.	32 Florida.	32 Vermont.
8 Indiana.	8 Kentucky.	33 New Hampshire.	33 Rhode Island.
9 Michigan.	9 Michigan.	34 Washington.	34 Florida.
10 Iowa.	10 Iowa.	35 Rhode Island.	35 Colorado.
11 Kentucky.	11 Texas.	36 Vermont.	36 District of Columbia.
12 Georgia.	12 Tennessee.	37 South Dakota.	37 Oregon.
13 Tennessee.	13 Georgia.	38 Oregon.	38 Delaware.
14 Wisconsin.	14 Virginia.	39 District of Columbia.	39 Utah.
15 Virginia.	15 North Carolina.	40 Utah.	40 Dakota.
16 North Carolina.	16 Wisconsin.	41 North Dakota.	41 New Mexico.
17 Alabama.	17 Alabama.	42 Delaware.	42 Washington.
18 New Jersey.	18 Mississippi.	43 New Mexico.	43 Nevada.
19 Kansas.	19 New Jersey.	44 Montana.	44 Arizona.
20 Minnesota.	20 Kansas.	45 Idaho.	45 Montana.
21 Mississippi.	21 South Carolina.	46 Oklahoma.	46 Idaho.
22 California.	22 Louisiana.	47 Wyoming.	47 Wyoming.
23 South Carolina.	23 Maryland.	48 Arizona.	
24 Arkansas.	24 California.	49 Nevada.	
25 Louisiana.	25 Arkansas.		

It will be seen that, as in 1880, New York still heads the list, and is followed by Pennsylvania. Ohio and Illinois have exchanged places. Of the other changes in the list the most marked are those of Texas, which rises from No. 11 to No. 7; Kentucky, which drops from 8 to 11; Minnesota, which rises from 26 to 20; Nebraska, which rises from 30 to 26; Maryland, which drops from 23 to 27; Colorado, which rises from 35 to 31; Vermont, which drops from 32 to 36; Washington, which rises from 42 to 34; Delaware, which drops from 38 to 42; Nevada, which drops from 43 to 49, and Arizona, which drops from 44 to 48. The average change in rank is 2.2 places.

I have the honor to be, sir, respectfully, yours,

ROBERT P. PORTER,
Superintendent of Census.

HON. JOHN W. NOBLE,
Secretary of the Interior.

REPORT OF THE COMMISSIONER OF THE GENERAL LAND-OFFICE.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., September 13, 1890.

SIR: In transmitting the Annual Report of the General Land Office for the fiscal year ending June 30, 1890, submitted herewith, I deem it proper to call attention to the increasing magnitude and importance of this office, and the great mass of laborious and intricate work annually performed by its officials. From comparatively a small beginning at its original organization by act of Congress of April 25, 1812, under the Treasury Department, it has grown with respect to the quantity, character, and multiplicity of the affairs committed to its charge, until its present force of officials, clerks, and other employes, many of whom are required to have legal or more than ordinary clerical ability, is unable to dispose of the vast accumulation of business with satisfactory expedition, and the necessity of its increase and additional office room is becoming yearly more apparent.

The result, however, of its administration during the fiscal year, as indicated in the accompanying report, is regarded as most gratifying under all the circumstances.

The great object of the Government is to dispose of the public lands to actual settlers only—to bona fide tillers of the soil—although liberal grants have been made by Congress to States and corporations for works of recognized public utility. To give effect to all the various statutes on the subject is the duty devolving on this office. Accordingly, an agricultural domain of nearly 19,000,000 acres—a domain almost equal to the aggregate area of the States of New Hampshire, Massachusetts, Rhode Island, Connecticut, and New Jersey—has, during the year been transferred to enterprising and industrious settlers, by patents issued to them for the above area, while the areas patented to the States, under the swamp grant, and to corporations, under special grants, have been great, although somewhat reduced, as compared with previous years. At the same time, the area of coal and mineral lands patented has been greatly increased over that of the fiscal year ending June 30, 1889, thus tending to the development of our immense deposits of coal and metals of every grade. The area patented to the States, under the grants for educational and internal improvement purposes, has increased 300 per cent.

This completed work, as shown by the following figures and facts, indicating increased population, increased coal and mineral development, and increased educational development and resources, is adverted to as a suggestive element in the national progress.

TRANSACTIONS OF THE OFFICE DURING THE YEAR ENDING JUNE 30, 1890.

AGRICULTURAL PATENTS ISSUED.

The class of patents embraced under this head includes all patents issued on final and commuted homestead entries, on pre-emption, timber culture, desert, private cash, town-site and other entries embracing land of an agricultural non mineral character.

The number of such agricultural patents issued during the fiscal year ending June 30, 1890, was 117,247, embracing 18,759,520 acres. The number issued during the fiscal year ending June 30, 1889, was 70,141, including an area of 11,222,560 acres, showing an increase during the fiscal year ending June 30, 1890, of 47,106 patents, and of 7,536,960 acres of land.

MINERAL PATENTS.

Of mineral and millsite patents, 1,407 were issued, as against 913 during the previous fiscal year, an increase of 494 patents. Of coal patents, 224 were issued, as against 155 patents during the previous year, an increase of 69, and including an area of 33,473.72 acres, as against an area during the previous year of 17,096.80 acres, or an increase in area of 15,376.92 acres.

In the following exhibit are shown the States and Territories in which mineral patents were issued:

Coal land and mineral and millsite patents.

States and Territories.	Coal lands.	Acres.	Mineral and mill-site.
Alaska.....			5
Arizona.....			25
California.....		880.00	115
Colorado.....	127	19,064.06	591
Dakota.....			40
Idaho.....			42
Montana.....	9	1,040.00	388
Nevada.....			27
New Mexico.....	2	160.00	26
Oregon.....			10
Utah.....	19	2,890.84	113
Washington.....	37	5,664.34	8
Wyoming.....	25	3,843.58	21
Total.....	224	33,473.72	1,407

STATE SELECTIONS APPROVED.

The approvals during the year, under the different grants to the several states for educational and internal improvement purposes, and for public buildings, embraced an area of 539,779.84 acres.

The following exhibit gives the details by States:

State.	Grant.	Quantity granted.	Quantity approved up to July 1, 1889.	Approved during fiscal year ending July 1, 1890.	Total approved.	Remainder.
		Acres.	Acres.	Acres.	Acres.	Acres.
Alabama.....	University (a).....	46,080	44,297.53	1,650.93	45,948.46	131.54
Arizona.....	do.....	46,080		36,809.14	36,809.14	9,180.86
California.....	School indemnity (b).....			8,881.12		
Do.....	Internal improvement.....	600,000	492,682.87	5,012.73	498,265.60	1,734.40
Do.....	Seminary.....	46,080	44,822.16	1,154.07	45,976.23	103.77
Do.....	Agricultural College.....	150,000	148,499.00	1,220.82	149,719.82	280.18
Do.....	Public building.....	6,400	4,778.30	320.78	5,099.08	1,300.92
Colorado.....	Agricultural College.....	90,000	69,555.75	18,391.51	87,947.26	2,052.74
Florida.....	Internal improvement.....	500,000	407,761.09	77.85	497,838.94	2,161.06
Louisiana.....	School indemnity (d).....			63,621.49		
Minnesota.....	do.....			1,015.95		
Missouri.....	Agricultural College.....	330,000	324,623.65	5,348.86	329,972.51	27.49
Nevada.....	School indemnity.....	72,000,000	668,872.20	349,422.25	718,294.45	1,281,705.55
Washington.....	University.....	46,080	23,942.02	80.00	24,022.02	22,057.98
Wyoming.....	do.....	46,080		46,091.31	46,091.31	
Total.....				539,779.84		

a This is a second grant to Alabama of the same quantity for university purposes, the first grant having been previously adjusted.

b This is a grant of the sixteenth and thirty-sixth sections with indemnity following the grant. The exact quantity granted and indemnity due have not been ascertained.

c This total represents the quantity embraced in approvals that have been allowed to stand upon agreed adjustment.

d This is a grant of sections numbered 16 with indemnity following the grant. The exact quantity granted and the indemnity due have not been ascertained.

e Grant practically closed.

f This is a grant of quantity in lieu of the sixteenth and thirty-sixth sections restored to the public domain under act of June 16, 1880.

g This aggregate includes 9,228.36 acres indemnity selected under the original grant, and not under the grant of 2,000,000 acres made by the act of June 16, 1880.

h By approvals on July 2 of this year the remainder has been reduced to 1,238.79 acres.

i The grant is of 72 entire sections (46,080 acres if the sections contain exactly 640 acres each) but the 72 sections selected aggregated a few acres more than 46,080 acres.

The above stated acreage of 539,779.84 acres, as against an area during the previous fiscal year of only 132,350.61 shows an increase of 407,429.23 acres or over 300 per cent.

In Appendix K is a further detailed statement of adjustments of grants, with references to important decisions and rulings relative thereto.

SWAMP-LAND PATENTS.

In the following statement is shown by States the acreage of swamp lands patented during the year, as also the acreage selected by the states and approved by this office, and the aggregate acreage of such lands patented to the States, since the date of the swamp grant:

Total during year of swamp lands.

States.	Selected.	Approved.	Patented.	Total patented since date of grant.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Alabama			908.42	411,189.38
Arkansas		100.00	3,453.07	7,447,799.36
California		8,073.42	4,662.96	1,409,499.25
Florida	979.51	59,959.56	53,395.76	16,114,723.74
Illinois		49.00	49.00	4,435,611.45
Indiana				1,357,800.65
Iowa		440.00	685.13	1,180,929.34
Louisiana, 1849	182.28			8,798,598.23
Louisiana, 1850			2,918.17	278,129.49
Michigan				3,667,204.54
Minnesota	15,253.53		85.36	2,890,595.91
Mississippi		406.54	406.54	4,350,153.26
Missouri			3,692.29	3,415,521.27
Ohio				25,660.71
Oregon	2,810.21	40,265.85	36,082.72	110,682.80
Wisconsin		17,965.62	2,977.87	3,232,900.51
Total	19,216.53	126,590.49	102,350.89	57,200,324.40

Number of lists of swamp and school lands prepared for approval	73
Certified copies of lists prepared and transmitted to governors of the several States and to local officers	116
Patents executed	24

During the previous fiscal year ending on June 30, 1889, an area of 259,721.45 acres was patented to the several States under the swamp grants, but during the present fiscal year, as shown in above table, an area of only 109,351.89 acres was patented to the States, a decrease of 150,369.56 acres.

RAILROAD LANDS PATENTED.

There were patented or certified, under the law, for the benefit of railroad companies, during the year, 363,862.15 acres, as shown in the following table:

	<i>Acres.</i>
Iowa	89.00
Louisiana	77,813.27
Minnesota	291,773.91
Wisconsin	24,775.87
Total	363,862.15

as against an area patented to railroads during the previous fiscal year of 425,046.02 acres, or a decrease of 61,183.87 acres.

INDIAN AND MISCELLANEOUS PATENTS.

The exhibit following shows the area patented to the States, during the year, on private land claims, donations, Indian claims in severalty, and scrip locations:

Indian and miscellaneous patents issued year ending June 30, 1890.

	Acres.		Acres.
Indian Territory	43,444.12	Colorado	640.00
California	17,760.00	Arkansas	640.00
Florida	17,723.57	Washington	633.00
Louisiana	8,190.64	Mississippi	160.00
Wisconsin	7,231.70	Missouri	160.00
Oregon	4,871.53	Minnesota	153.00
Dakota	2,661.73	Indiana	50.00
Kansas	2,426.73		
Michigan	640.00	Total	109,056.02

or a decrease in area, as compared with the previous fiscal year, of 50,334.19 acres.

Recapitulation of patents issued,

Patents.	1889.	1890.	Increase.	Decrease.	Total net increase.
	Acres.	Acres.	Acres.	Acres.	Acres.
Agricultural	11,222,560.00	18,750,520.00	7,527,960.00		
Mineral	17,098.80	33,473.72	16,375.92		
State selections	132,350.61	539,779.84	407,429.23		
Swamp lands	259,721.45	109,351.89		150,369.56	
Railroad lands	425,046.02	363,802.15		61,243.87	
Indian lands	159,390.21	109,056.02		50,334.19	
Total	12,216,165.09	19,915,043.62	7,698,878.53	261,887.62	7,698,878.53

The following is a statement of the acreage of public lands disposed of during the fiscal year ending June 30, 1890:

CASH SALES.

	Acres.
Private entries	38,617.79
Public sales	28.66
Pre-emption entries	2,204,905.07
Timber and stone land entries	509,896.61
Mineral land entries	35,396.81
Desert land entries	478,849.56
Coal land entries	16,198.34
Town-site entries	1,745.57
Lassen County desert land entries	400.00
Excesses on homestead and other entries	15,194.80
Abandoned military reservations	1,613.54
	3,302,846.75

MISCELLANEOUS.

Homestead entries (original)	5,531,678.00
Timber-culture entries (original)	1,787,403.14
Entries with military bounty land warrants	19,034.32
Entries with private land scrip	10,439.52
State selections, school and swamp	258,141.33
Railroad selections	1,752,758.86
Indian allotments	2,167.85
Entries with Valentine scrip	119.60
Entries with Sioux half-breed scrip	150.99
Entries with Porterfield scrip	5.22
Donation entries	785.81

Total 9,362,655.24

Total area of public land entries and selections..... 12,665,531.99

INDIAN LANDS.

	Acres
Cherokee school lands.....	2,352
Ute lands.....	61,656
Sioux lands.....	57,096
Osage trust and diminished reserve.....	11,762
Osage ceded.....	95
Kansas trust and diminished reserve.....	333
Winnebago lands.....	427
Utah lands.....	163
Total.....	132,365
Making a grand total of.....	12,798,837.

RECAPITULATION.

Area sold for cash.....	3,302,846
Miscellaneous entries.....	3,362,686
Indian lands.....	132,365
Total.....	12,798,837.

The foregoing does not include the following entries, the areas which have been previously reported in the "original entries" of the respective classes:

	Acres
Commuted homestead (section 2301, R. S.).....	905,536
Commuted homestead act, June 15, 1880.....	4,348
Final desert land entries.....	244,534
Final homestead entries.....	4,669,592
Final timber-culture entries.....	423,048
Total areas previously reported.....	5,638,061.

CASH RECEIPTS.

The following is a statement of the cash receipts of the office from various sources during the fiscal year ending June 30, 1890:

From cash sales.....	\$6,349,174.
Homestead fees and commissions.....	697,623
Timber-culture fees and commissions.....	173,145
Fees on locations of military bounty land warrants.....	599
Fees on scrip locations.....	17
Fees on donation claims.....	25
Fees on State selections.....	3,619
Fees on railroad selections.....	21,913
Fees on pre-emption and other filings.....	123,759
Fees for reducing testimony to writing, etc.....	101,604
Total receipts from public lands.....	7,470,870.
Receipts from disposal of Indian lands.....	293,062
Timber depredations.....	16,585
Total.....	7,780,517.

The filings made and the fees therefrom are stated in the annexed table.

Kind of filings.	Number of filings.	Fees.
Pre-emption.....	25,329	\$65,164.00
Homestead.....	712	1,571.00
Coal.....	1,645	4,927.00
Lassen County desert.....	174	522.00
Town lot.....	2	6.00
Town-site.....	2	5.00
Valentine scrip.....	45	45.00
Girard scrip.....	1	
Mineral applications.....	1,293	12,930.00
Timber and stone applications.....	3,617	36,170.00
Total.....	32,820	121,340.00
Add to this mineral adverse claims.....	241	2,410.00
	33,061	123,750.00

* * * * *

MINERAL LANDS.

One thousand three hundred and fourteen mineral entries, embracing 35,396.81 acres, were made.

One hundred and eighteen coal entries were made, embracing 16,198.34 acres.

One thousand four hundred and seven mineral patents and two hundred and twenty-four coal patents were issued, the coal patents embracing an area of 33,773.72 acres. This is an increase of over 50 per cent. of mineral and coal patents issued, as compared with last year.

One thousand six hundred and forty-eight current mineral and coal entries were examined, an increase over last year of about 60 per cent., and 1,958 suspended mineral and coal entries were re-examined, as against 1,544 for previous year.

* * * * *

VACANT OR UNSETTLED PUBLIC LANDS.

Every effort in my power has been made to obtain at least approximate areas and their location in the several land States and Territories of vacant or unsettled public lands. The local land officers, in their respective districts, have labored faithfully to furnish this information. But with all their assiduity I have been unable to obtain completed returns from all the States for my report proper. But a complete statement will doubtless be included in appendix C of this report. To illustrate the value of this information, I will mention with reference to the Southern States, as to which many inquiries have been received in regard to particular localities, that 685,900 acres of vacant and surveyed land in the Montgomery district, Alabama, have been reported; in Louisiana, in the New Orleans district, an approximate of 825,669 acres; in Arkansas (entire), 4,902,329 acres; in Mississippi (entire), 1,407,480 acres; in Florida (entire), 2,283,626 acres surveyed and over 3,000,000 acres of unsurveyed lands. It is probable, however, that the larger part of the unsurveyed Florida lands have passed to the State under the swamp grants, or is swamp in character.

PAPERS ACCOMPANYING THE
RAILROADS.

The mileage of land-grant railroads actually constructed up to the close of the last fiscal year was 18,070.71 miles, of which 40 miles were constructed during the year.

The lists of railroad selections at the close of the last fiscal year awaiting examination or action covered 29,471,709.09 acres; the selections for wagon roads in Oregon covered 305,246.67 acres; making an acreage of 29,776,955.76 acres embraced in pending lists of selections for railroad and wagon-road construction.

Public lands certified or patented to States and corporations up to 1890.

	Acres.
For railroad purposes (1850 to 1890).....	51,379,346.21
For wagon-road purposes (1824 to 1890).....	1,722,730.83
For canal purposes (1828 to 1890).....	4,424,072.06
For river improvements (1822 to 1890).....	1,496,219.80
	58,992,369.90

SWAMP LANDS.

In the adjustment of claims for swamp lands and swamp-land indemnity, six special agents were employed during the year in making personal examinations in the field of lands claimed under the swamp grant, and were present on behalf of the Government at the taking of the testimony presented by the respective States relative to the character of the land, in accordance with the rules and regulations of the Department, dated August 12, 1878.

During the past fiscal year, 19,216.53 acres were claimed and reported to this office under the acts of Congress, approved September 28, 1850, and March 12, 1860, granting swamp and overflowed lands to the several States, making the total area claimed and reported under said acts 80,218,419.21 acres.

Lists embracing 126,990.49 acres have been formally approved to the several States during the past year, increasing the total amount thus approved to 59,100,462.67 acres, including 8,708,588.48 acres approved to the State of Louisiana, pursuant to the provisions of the act of March 2, 1849, under which act the approval has the force and effect of a patent.

Patents have been issued during the last fiscal year under the acts of September 28, 1850, and March 12, 1860 (Secs. 2479, 2480, 2481, and 2490, Rev. Stat.) for 109,351.89 acres, or a decrease as compared with the previous year of 150,369.56 acres, making the total patented under said acts and approved under the act of March 2, 1849, 57,209,324.43 acres.

No land was disposed of during the last fiscal year under the provisions of the swamp land grant of March 2, 1849. This grant applies only to the State of Louisiana.

Under the indemnity acts of March 2, 1855, and March 3, 1857, during the past year, cash indemnity accounts amounting to \$32,472.83 were examined and allowed, and the tracts patented to the several States as indemnity amounted to 7,906.63 acres.

The total amount of swamp-land indemnity adjusted and allowed since the passage of the indemnity act is 1,566,011.41 acres for cash

entries of swamp land, and 588,126.23 acres patented in lieu of swamp lands located with military bounty land warrants and scrip.

The correspondence and general work relating to swamp lands have been kept up as far as possible, and a larger number of old cases has been finally disposed of this year than in the preceding one.

New selections are being made and reported constantly, and considerable progress has been made in the adjustment of such claims.

* * * * *

SURVEYS OF PUBLIC LANDS.

During the fiscal year ending June 30, 1890, surveys have been accepted, after an examination in the field and careful comparison with the examiner's reports and inspection of the plats and field notes in this office, as follows:

States and Territories.	Acres.	States and Territories.	Acres.
Arizona	597,748.27	Nebraska	23,039.51
California	162,031.41	Nevada	408,857.33
Colorado	473,457.72	New Mexico	237,131.78
Dakota	929,992.35	Oregon	84,100.46
Florida	2,519.33	Utah	576,525.50
Idaho	22,148.58	Washington	180,122.99
Minnesota	144,855.29		
Montana	620,161.42	Total	4,462,691.94

* * * * *

PROTECTION AND DISPOSAL OF THE PUBLIC LANDS.

The hearings and important labor performed during the year by the special service division and its agents in the field are shown in detail in Appendix P.

FRAUDULENT LAND ENTRIES.

In the investigation of fraudulent land entries and otherwise in the important duty of protecting the public lands from illegal appropriation during the year sixty-one agents were employed; their aggregate length of service was four hundred and nineteen months and eighteen days, being equivalent to the employment of thirty-four agents for the entire year and one agent for eleven months and eighteen days.

The number of reports received from special agents and acted on are as follows:

Pending June 30, 1889	273
Received during the year	2,027
Total	2,300
Acted on during year	1,785
Leaving pending June 30, 1890	515

To special agents, during the year, were referred 2,684 cases for investigation, 243 hearings were ordered, 437 cases were held for cancellation, 538 were canceled, and 1,909 were examined and passed. Final action was taken in 5,938 cases, and 7,025 cases of all descriptions in the different States shown in the following table were pending June 30, 1890.

Awaiting action are 482 records of hearings and 448 registers* and receivers' reports and miscellaneous letters. During the year there were received 16 reports of unlawful inclosures of public land, involving, as far as ascertained, 115,455 acres. In 8 cases suits were recommended, and in 8 cases the fences are reported as having been removed.

Cases pending in Division P June 30, 1890.

	Alabama.	Arizona.	Arkansas.	California.	Colorado.	Florida.	Idaho.	Iowa.	Kansas.	Louisiana.	Michigan.	Minnesota.	Mississippi.
Homesteads.....	28	21	23	215	3	33	4	...	30	68	14	34	71
Final homesteads.....	30	2	28	76	0	1	3	2	10	16	4	13	1
Commuted homesteads.....	40	...	...	155	18	15	5	...	16	1	2	42	...
Pre-emption—cash.....	14	19	...	491	362	1	31	...	173	...	9	129	...
Pre-emption—declaratory statements.....	...	5	3	8	21	...	6	...	11	1	4	7	...
Timber-culture entries.....	...	17	...	17	55	...	2	...	6	5	...	...	...
Final timber-culture entries.....	...	...	...	...	...	...	...	...	3	...	...	1	...
Timber and stone lands.....	...	...	...	1,555	...	...	...	...	...	...	...	...	...
Desert lands.....	...	25	...	31	...	...	50	...	...	...	...	...	...
Final desert land.....	...	11	...	16	...	...	24	...	...	...	...	...	...
Private—cash.....	...	...	25	...	1	1	...	...	...	1	...	...	...
Mineral land.....	...	...	...	7	23	...	...	...	...	...	...	...	...
Coal land.....	...	...	...	...	22	...	...	...	...	...	...	...	...
Coal land—declaratory statements.....	...	...	...	...	17	...	...	...	...	...	...	...	...
Total.....	121	100	79	2,571	583	51	125	2	235	80	33	211	12

Cases pending in Division P June 30, 1890.

	Missouri.	Montana.	Nebraska.	Nevada.	New Mexico.	North Dakota.	Oregon.	South Dakota.	Utah.	Washington.	Wisconsin.	Wyoming.	Total.
Homesteads.....	3	4	15		77	32	26	13	0	35	3	7	778
Final homesteads.....	13	0	8		142	19	10	17	14	0	8	11	447
Commuted homesteads.....		2	10		34	26	1	49		20	5	5	453
Pre-emption—cash.....	14	42			334	105	63	257	5	87	11	34	2,177
Pre-emption—declaratory statements.....		6	4		21		7	4	3	4	1		115
Timber-culture entries.....			15		46	24	26	14	0	1		5	240
Final timber-culture entries.....								2					6
Timber and stone lands.....							58			496			2,109
Desert lands.....		25		1	45				32			16	315
Final desert land.....		11			15		12		8	1		100	158
Private—cash.....					10								36
Mineral land.....		0			9							2	47
Coal land.....		1								39		15	70
Coal land—declaratory statements.....									51	4			73
Total.....	16	75	103	1	773	200	267	356	117	689	26	231	7,025

TIMBER TRESPASS.

In the protection of the public timber lands during the year fifty-five timber agents were employed, aggregating a length of service of three hundred and fifty-one months and fourteen days, which was equivalent to the employment of twenty-nine agents for one year and one for three months and fourteen days.

Special agents during the year reported three hundred and ten cases of timber trespass, involving public timber and the products therefrom valued at \$3,067,151.66. The following is a statement of the sums re-

covered during the fiscal year by the Government from suits for timber trespass:

Accepted under propositions of settlement.....	\$12,692.42
On settlements accepted during previous years	275.00
Sales of timber and lumber	4,552.40
Recovered through legal proceedings*.....	83,420.50
	<hr/> \$100,940.32

In addition to the above, there were pending on July 1, 1890, as far as reported, two hundred and eighty-two civil suits for the recovery of \$14,794,286.55 for timber reported as having been unlawfully cut from the public lands, and three hundred and six criminal prosecutions for violations of the timber laws.

* * * * *

LEWIS A. GROFF,
Commissioner.

Hon. JOHN W. NOBLE,
Secretary of the Interior.

PUBLIC LANDS DIVISION.

Vacant lands in the public land States and Territories.

By circular of July 10, 1890, the district officers were directed to report approximately the quantities of lands in the several counties and parishes in their districts not embraced in Indian or military reservations remaining unappropriated by filing or entry. The records of this office are not kept by counties; but inasmuch as many inquiries have been received as to the quantity of unappropriated lands remaining in particular counties, parishes, or localities, it was concluded to make a statement for this report by counties so far as reports from the district officers in such shape could be obtained, and to make the statement by land districts in other cases.

It has not been practicable for many reasons, such as the magnitude of the work involved, the manner of creating the boundaries of counties and the frequent changes therein, and also the fact that a large part of the unsurveyed public domain lies within the limits of grants to railroads, to more than obtain approximate estimates of the lands not covered by entries or filings; but the statement will serve the purpose for which it is made, to wit, to inform correspondents and the general public as to whether there is much, little, or any public land in the several public-land States and Territories and the land districts therein, and, in most instances, in particular counties or localities.

The statement, it is believed, shows an aggregate of vacant lands somewhat in excess of the exact quantity now subject to settlement or entry, for reasons which will appear by reference to certain of the foot-notes, but it is highly probable that this excess will be offset fully by restoration to the public domain through declarations by Congress of forfeitures of railroad grants, the opening of lands in the Indian Territory to entry, and abandonment and cancellation of the claims of settlers.

It must be borne in mind that quite a considerable portion of the vacant land is embraced in the heavily timbered regions of the Southern States, the lake region, and the Pacific coast, and the mountainous and arid regions of the far west, and that the portion of land cultivable without clearing or irrigation is comparatively small. It is a reason-

able conclusion, however, that vast bodies of arid lands will in time be reclaimed by irrigation as the result of the efforts of the government to construct storage basins and ditches for the purpose, seconded, as undoubtedly they will be, by private enterprise, and that, as a consequence, the rain areas of the West will be considerably enlarged.

In naming the land districts in the following statement, the names of the present offices are adopted as the names of the districts, for the reason that districts are thus named and known by the settlers, and because it would be inconvenient to give the statutory names of the different districts created by Congress in addition to the names of the offices.

Statement by States, Territories, and land districts, and also by counties where practicable, of lands not granted or reserved and subject to settlement or entry.

ALABAMA.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Huntsville.....	Mount.....	6,520		
	Cherokee.....	a 12,280		
	Colbert.....	5,899		
	Cullman.....	6,460		
	De Kalb.....	2,530		
	Etowah.....	4,383		
	Fayette.....	b 1,800		
	Jackson.....	57,060		
	Lauderdale.....	4,530		
	Limestone.....	5,049		
	Lawrence.....	45,320		
	Lamar.....	c 44,640		
	Marion.....	68,560		
	Marshall.....	6,660		
	Madison.....	19,760		
	Morgan.....	5,080		
	St Clair.....	d 1,700		
	Walker.....	e 7,920		
	Winston.....	111,180		
	Cherokee school land..			401,640
				f 13,530
Total.....				g 419,160
Montgomery.....	Antelope.....	880		
	Babb.....	3,720		
	Barber.....	840		
	Bartow.....	60		
	Barnes.....	440		
	Barlow.....	90,480		
	Crockett.....	2,700		
	Conecuh.....	2,080		
	Corryington.....	37,920		
	Cotton.....	5,040		
	Clark.....	13,780		
	Choctaw.....	51,920		
	Coma.....	13,480		
	Chilton.....	4,060		
	Chambers.....	43		
	Cherokee.....	23,800		
	Calhoun.....	7,200		
	Cherokee.....	45,940		
	Cherokee.....	5,120		
	Clay.....	5,040		
	Bole.....	280		
	Blount.....	30,120		
	Birmingham.....	221,320		
	Fayette.....	24,840		
	Geneva.....			

a Total in Huntsville and Montgomery districts, 14,330 acres.

b Total in Huntsville and Montgomery districts, 23,170 acres.

c Total in Huntsville and Montgomery districts, 44,560 acres.

d Total in Huntsville and Montgomery districts, 4,980 acres.

e Total in Huntsville and Montgomery districts, 20,600 acres.

f These lands are sold for cash at private entry for the benefit of the Cherokee school fund.

g This total does not include land containing coal and iron contemplated to be offered at public sale by the act of March 3, 1863.

A See Huntsville district.

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Statement by States, Territories, and land districts, etc.—Continued.

ALABAMA—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Montgomery	Green	400		
	Hale	760		
	Henry	6,480		
	Jefferson	10,929		
	Lee	80		
	Lamar	520		
	Monroe	23,280		
	Macon	80		
	Mobile	89,040		
	Marengo	2,760		
	Pickens	5,600		
	Pike	1,280		
	Perry	820		
	Russell	1,040		
	Randolph	4,840		
	Santer	760		
	St. Clair	3,280		
	Shelby	3,960		
	Talladega	12,160		
	Tallapoosa	1,040		
	Tuscaloosa	63,280		
	Washington	88,160		
	Walker	12,760		
	Wilcox	1,620		
Total				685,900
Total in Alabama				1,108,060

ARIZONA.

Prescott	Apache	3,800,000	b 1,133,120	c 4,933,120
	Gila	100,000	50,000	d 150,000
	Mohave	22,980	e 6,151,000	f 6,174,580
	Yavapai	2,280,060	715,092,000	717,372,000
Total		g 6,202,080	22,420,720	28,622,790
Tucson	Apache	13,440	27,760	h 41,200
	Cochise	i 1,374,240	2,524,320	3,898,560
	Gila	50,780	410,020	h 460,800
	Graham	758,870	2,230,862	2,989,732
	Maricopa	292,400	3,690,900	i 4,483,300
	Pima	1,300,000		1,300,000
	Pinal	862,494	2,220,406	3,082,900
	Yuma	628,422	4,184,378	4,812,800
Total		5,780,646	15,268,706	21,069,352
Total in Arizona		11,983,626	37,715,420	49,699,052

a See Huntsville district.

b Subject to entry and the railroad grant.

c Total in Apache county in Prescott and Tucson districts, 4,974,320 acres.

d Total in Gila county in Prescott and Tucson districts, 610,800 acres.

e The unsurveyed lands in Mohave county are either subject to settlement or to the railroad grant less the Hualapai Indian reserve, area of which is unknown.

f The unsurveyed lands in Yavapai county are subject either to settlement or the railroad grant.

g The district officers state that 468,880 acres are embraced in entries, but whether this quantity should be deducted from the aggregate of surveyed lands reported does not appear.

h See Prescott district.

i A small portion of Maricopa county is in Prescott district. Of this portion very little has been surveyed and the Prescott officers make no mention of it in their report.

Statement by States, Territories, and land districts, etc.—Continued.

ARKANSAS.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Camden	Ashley	a 28,528		
	Bradley	38,640		
	Clark	24,080		
	Columbia	9,520		
	Calhoun	46,000		
	Cleveland	b 5,700		
	Drew	c 8,800		
	Garland	d 102,320		
	Howard	109,800		
	Hot Springs	e 39,200		
	Hempstead	4,240		
	Lafayette	12,360		
	Little River	17,400		
	Miller	5,000		
	Montgomery	210,900		
	Nevada	2,640		
	Ouachita	10,400		
	Pike	120,800		
	Polk	f 300,000		
	Serier	63,900		
	Union	46,910		
Total				1,235,710
Dardanelle	Conway (west part) ..	g 15,000		
	Crawford	50,000		
	Franklin	h 45,000		
	Garland (north part) ..	d 75,000		
	Johnson	115,000		
	Logan	67,000		
	Perry	i 140,000		
	Polk (northwest part) ..	j 35,000		
	Pope	165,000		
	Saline (northwest part) ..	k 61,000		
	Yell	185,000		
	Scott	315,000		
	Sebastian	31,000		
Total				1,202,000
Harrison	Baxter	113,040		
	Benton	47,920		
	Bocoe	69,430		
	Carroll	80,480		
	Franklin	11,500		
	Fulton	m 120,400		
	Independence	n 7,700		
	Isard	o 44,100		
	Madison	90,040		
	Marion	124,340		
	Newton	259,020		
	Seaway	282,300		
	Stone	140,380		
	Van Buren	p 34,060		
	Washington	24,480		
Total				1,432,470
Little Rock	Arkansas	1,700		
	Ashley	j 3,520		
	Chicot	40		
	Clay	4,600		
	Cleburne	139,640		
	Cleveland	j 6,680		

a Total in Camden and Dardanelle districts, 31,770 acres.

b Total in Camden and Little Rock districts, 12,080 acres.

c Total in Camden and Little Rock districts, 8,120 acres.

d Total in Camden, Dardanelle, and Little Rock districts, 182,280 acres.

e Total in Camden and Little Rock districts, 45,080 acres.

f Total in Camden and Dardanelle districts, 374,800 acres.

g Total in Dardanelle and Little Rock districts, 20,400 acres.

h Total in Dardanelle and Harrison districts, 44,500 acres.

i Total in Dardanelle and Little Rock districts, 160,680 acres.

j See Camden district.

k Total in Dardanelle and Little Rock districts, 110,920 acres.

l See Dardanelle district.

m Total in Harrison and Little Rock districts, 190,920 acres.

n Total in Harrison and Little Rock districts, 48,600 acres.

o Total in Harrison and Little Rock districts, 54,540 acres.

p Total in Harrison and Little Rock districts, 266,240 acres.

Statement by States, Territories, and land districts, etc.—Continued.

ARKANSAS—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Little Rock.....	Conway.....	a11,400		
	Craighead.....	1,600		
	Cross.....	1,000		
	Dallas.....	8,880		
	Deaha.....	1,160		
	Drew.....	b2,240		
	Faulkner.....	10,200		
	Fulton.....	b70,200		
	Garland.....	c4,960		
	Grant.....	6,120		
	Greene.....	4,720		
	Hot Springs.....	b6,480		
	Independence.....	d41,040		
	Izard.....	d10,240		
	Jackson.....	840		
	Jefferson.....	2,000		
	Lawrence.....	9,720		
	Lee.....	160		
	Lincoln.....	10,220		
	Lonoke.....	200		
	Mississippi.....	4,760		
	Monroe.....	240		
	Perry.....	a20,680		
	Phillips.....	40		
	Poinsett.....	5,860		
	Prairie.....	280		
	Pulaski.....	21,360		
	Randolph.....	61,600		
	Saline.....	a58,920		
	Sharp.....	112,480		
	St. Francis.....	480		
	Van Buren.....	d260,380		
	White.....	10,240		
Total.....				916,140
Total in Arkansas.....				4,902,829

CALIFORNIA.

Humboldt.....		4,584,960	115,200	4,700,160
Independence.....	Alpine.....	21,760		f21,760
	Fresno.....	561,020	209,520	g861,440
	Inyo.....	2,179,200	3,326,720	5,505,920
	Kern.....	1,256,320	244,480	h1,500,800
	Mariposa.....	65,280	11,520	i76,800
	Mono.....	1,888,000	750,720	2,638,720
	San Bernardino.....	2,149,120	1,813,760	j3,962,880
	Tulare.....	482,560	80,600	k572,160
	Tuolumne.....	80,640	92,100	l172,800
Total.....		8,684,800	6,628,480	15,313,280
Los Angeles.....	Kern.....	119,120	47,339	m166,459
	Los Angeles.....	550,417	246,734	797,151
	Orange.....	3,799	25,400	29,199
	San Bernardino.....	2,484,708	2,243,371	n4,728,079
	San Diego.....	3,891,813	3,102,493	6,994,306

a See Dardanelle district.

b See Camden district.

c See Camden and Dardanelle districts.

d See Harrison district.

e The officers report that county lines have been changed since publication of the latest maps, and that it is impracticable to make the statement by counties.

f Total in Independence and Sacramento districts, 671,380 acres.

g Total in Independence, San Francisco, Stockton, and Visalia districts, 1,929,460 acres.

h Total in Independence, Los Angeles, San Francisco, and Visalia districts, 2,284,755 acres.

i Total in Independence and Stockton districts, 575,497 acres.

j Total in Independence and Los Angeles districts, 8,690,959 acres.

k Total in Independence and Visalia districts, 1,116,160 acres.

l Total in Independence, Sacramento, and Stockton districts, 867,216.

m See Independence district.

Statement by States, Territories, and land districts, etc.—Continued.

CALIFORNIA—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Los Angeles	Santa Barbara	45,070	92,297	<i>a</i> 137,367
	Ventura	166,890	78,590	<i>b</i> 245,480
Total		7,172,377	5,830,324	13,002,701
Marysville	Butte	211,818	33,425	246,243
	Colusa	143,158	1,683	<i>c</i> 144,841
	Nevada	7,014		<i>d</i> 7,014
	Plumas	261,967	70,472	<i>e</i> 332,439
	Sutter	3,000		3,000
	Sierra	29,095	11,200	<i>f</i> 40,295
	Tehama	70,418	803	<i>g</i> 71,221
	Yuba	75,883	7,210	83,093
	Yuba	60,150	83,780	143,930
Total		869,533	158,655	1,028,188
Redding	Shasta	944,203	118,014	1,062,217
	Siskiyou	972,733	273,978	1,246,711
	Tehama	461,876	16,963	<i>h</i> 478,839
	Tribute	272,583	51,611	324,194
Total		2,651,395	469,566	3,120,961
Sacramento	Alpine	408,820	150,800	559,620
	Amador	221,500	5,000	226,500
	Calaveras	248,500	4,900	253,400
	Eldorado	610,800	35,300	646,100
	Nevada	185,000	4,100	189,100
	Placer	359,100	57,900	417,000
	Plumas	153,840		153,840
	Sierra	163,500	4,000	167,500
	Tuolumne	265,000	17,200	282,200
Total		2,772,120	270,100	3,042,220
San Francisco	Alameda	8,200		8,200
	Colusa	153,200	8,500	<i>i</i> 161,700
	Fresno	195,000	2,062	197,062
	Kern	61,500	85,000	146,500
	Lake	406,600	111,500	518,100
	Mendocino	787,150	203,980	991,130
	Merced	39,240		39,240
	Monterey	1,021,840	82,240	1,104,080
	Napa	23,500		23,500
	San Benito	290,700	5,115	295,815
	San Joaquin	10,760		10,760
	San Luis Obispo	384,080	150,012	534,092
	San Mateo	2,400		2,400
	Santa Barbara	443,741	127,988	<i>m</i> 571,729
	Santa Clara	84,880	5,000	89,880
	Santa Cruz	2,200		2,200
	Solano	2,218		2,218
	Sonoma	49,560	41,252	90,812
	Stanislaus	34,800	5,737	<i>n</i> 40,537
	Ventura	215,224	56,347	<i>o</i> 271,571
Total		4,216,703	836,417	5,053,120
Stockton	Calaveras	618,000		618,000
	Fresno	1670,678		1,670,678

a Total in Los Angeles and San Francisco districts, 769,744 acres.*b* Total in Los Angeles and San Francisco districts, 517,051 acres.*c* Total in Marysville and San Francisco districts, 268,541 acres.*d* Total in Marysville and Sacramento districts, 139,111 acres.*e* Total in Marysville, Sacramento, and Susanville districts, 1,596,914 acres.*f* Total in Marysville, Sacramento, and Susanville districts, 281,432 acres.*g* Total in Marysville and Redding districts, 650,091 acres.*h* See Marysville district.*i* See Independence district.*j* Total in Sacramento and Stockton districts, 271,480 acres.*k* Total in San Francisco and Stockton districts, 25,111 acres.*l* Total in San Francisco and Stockton districts, 2,160 acres.*m* See Los Angeles district.*n* Total in San Francisco and Stockton districts, 29,440 acres.*o* See Sacramento district.

Statement by States, Territories, and land districts, etc.—Continued.

CALIFORNIA—Continued.

Land district	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Stockton.....	Merced.....	a 38,881	.....	.....
	Mariposa.....	b 498,697	.....	.....
	San Joaquin.....	c 2,340	.....	.....
	Stanislaus.....	a 49,963	.....	.....
	Tuolumne.....	b 412,216	.....	.....
Total.....		1,688,795	c 500,445	2,189,240
Susana ville.....	Lassen.....	2,297,936	39,663	2,337,619
	Modoc.....	1,714,028	111,699	1,825,727
	Plumas.....	909,810	79,825	d 989,635
	Sierra.....	56,637	.....	d 56,637
Total.....		4,909,411	231,207	5,200,618
Visalia.....	Fresno.....	184,320	15,360	b 199,680
	Kern.....	450,680	69,120	b 520,000
	Tulare.....	505,280	38,720	b 544,000
Total.....		1,140,480	123,200	1,263,680
Total in California.....		98,750,564	15,172,154	83,622,718

COLORADO.

Central City.....	Boulder.....	199,080	.....	a 199,080
	Clear Creek.....	102,382	.....	102,382
	Eagle.....	221,200	.....	f 221,200
	Gilpin.....	52,792	.....	52,792
	Grand.....	1,007,830	43,820	g 1,051,400
	Jefferson.....	86,280	.....	h 86,280
	Monte.....	152,960	.....	i 152,960
	Summit.....	217,600	.....	j 217,600
Total.....		2,040,174	43,820	2,083,994
Del Norte.....	Conejos.....	403,840	180,880	590,820
	Costilla.....	77,400	287,040	364,500
	Hinsdale.....	276,800	46,000	k 322,800
	Rio Grande.....	477,580	.....	l 477,580
	Saguache.....	1,025,240	50,220	m 1,075,460
	San Juan.....	3,840	23,040	n 26,880
Total.....		2,264,860	503,180	2,858,040
Denver.....	Arapahoe.....	1,128,800	.....	.....
	Boulder.....	o 24,220	.....	.....
	Douglas.....	142,310	.....	.....
	Elbert.....	p 269,280	.....	.....
	Jefferson.....	q 28,900	.....	.....
	Kit Carson.....	r 425,920	.....	.....
	Larimer.....	1,235,360	.....	.....

a See San Francisco district.

b See Independence district.

c This total was not estimated by counties, but the officers report fifteen full townships in the district unsurveyed, and unsurveyed lands in the townships partly surveyed, aggregating 154,845 acres.

d See Marysville district.

e Total in Central City and Denver districts, 121 3.0 acres.

f Of this quantity four townships, or 87,640 acres, are suspended from entry because of irregularities in the surveys. Total area in Central City, Glenwood Springs, and Leadville districts, 868,192 acres.

g Of the surveyed land in Grand county thirteen townships, or 222,850 acres, are suspended from entry because of irregularities in the surveys.

h Of this quantity one township of 21,760 acres is suspended from entry because of irregularities in the survey. Total area in Central City and Denver districts, 115,180 acres.

i Total in Central City and Glenwood Springs districts, 3 781,061 acres.

j Total in Central City and Leadville districts, 387 355 acres.

k Total area in Del Norte, Durango, and Gunnison districts, 900,100 acres.

l Total area in Del Norte and Durango districts, 525 080 acres.

m Total in Del Norte and Gunnison districts, 1,412,460 acres.

n Total in Del Norte and Durango districts, 249,380 acres.

o See Central City district.

p Total in Denver and Pueblo districts, 461,180 acres.

q Total in Denver and Lamar districts, 595,920 acres.

r Total in Denver and Glenwood Springs districts, 1,263,160 acres.

Statement by States, Territories, and land districts, etc.—Continued.

COLORADO—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Denver	Lincoln	a 217, 120		
	Logan	325, 740		
	Morgan	316, 500		
	Phillips	30, 830		
	Sedgwick	58, 400		
	Washington	263, 300		
	Weld	863, 280		
	Yuma	279, 200		
Total				5, 631, 240
Durango b	Archuleta	c 205, 200		205, 200
	Doñorosa	475, 240	124, 000	d 599, 240
	Hinsdale	203, 800	97, 500	e 301, 300
	La Plata	499, 240	29, 000	f 528, 240
	Montezuma	786, 760	75, 000	g 861, 760
	Ouray	9, 500		h 9, 500
	Rio Grande	47, 500		i 47, 500
	San Juan	222, 500		j 222, 500
	San Miguel	42, 000		k 42, 000
Total		2, 621, 840	325, 500	2, 947, 340
Glenwood Springs	Pagle	348, 000	215, 040	l 563, 040
	Garfield	1, 440, 000	923, 240	m 2, 363, 240
	Gunnison	53, 280	124, 620	n 177, 900
	Larimer	27, 820		o 27, 820
	Mesa	195, 200	229, 220	p 424, 420
	Pueblo	170, 800	323, 700	q 494, 500
	Rio Blanco	1, 459, 872	650, 704	r 2, 110, 576
	Routt	3, 028, 124	23, 040	s 3, 051, 164
Total		7, 840, 076	2, 429, 584	9, 769, 660
Gunnison	Delta	7, 000		t 7, 000
	Gunnison	700, 000	987, 000	u 1, 687, 000
	Hinsdale	246, 000	30, 000	v 276, 000
	Montrose	30, 000	61, 000	w 91, 000
	Saguache	337, 000		x 337, 000
Total		1, 320, 000	1, 078, 000	2, 398, 000
Lamar	Park	710, 000		
	Bent	268, 000		
	Cheyenne	298, 000		
	Elk Canon	1170, 000		
	Kiowa	315, 000		
	Las Animas	1809, 000		
	Lincoln	1146, 000		
	Prowers	437, 000		
Total				2, 853, 000

a Total in Denver and Lamar districts, 363,120 acres.

b The Southern Ute Reservation, covering about 1,000,000 acres, is in this district and may soon be required to entry.

c The abandoned Fort Lewis military reservation in Archuleta County of about 30,000 acres of agricultural land, heavily timbered, has been surveyed, but the plats have not as yet been filed and the land restored to the public domain.

d Total in Durango and Montrose districts, 639,620 acres.

e See Del Norte district.

f Of the 20,000 acres in La Plata county, classed above as unsurveyed, 23,000 acres have been surveyed, and the plats it is expected will soon be filed.

g Much of the land in Montezuma county is known as the mesa verde land, and is not in demand by settlers.

h Total in Durango and Montrose districts, 163,803 acres.

i Total in Durango and Montrose districts, 711,704 acres.

j See Central City district.

k Total in Glenwood Springs, Gunnison, and Leadville districts, 1,000,629 acres.

l See Denver district.

m Total in Glenwood Springs and Montrose districts, 1,995,044 acres.

n Total in Glenwood Springs and Leadville districts, 504,002 acres.

o Total in Gunnison and Montrose districts, 387,329 acres.

p See Glenwood Springs district.

q Total in Gunnison and Montrose districts, 1,371,737 acres.

r Total in Lamar and Pueblo districts, 452,200 acres.

s Total in Lamar and Pueblo districts, 321,000 acres.

t Total in Lamar and Pueblo districts, 1,179,552 acres.

Statement by States, Territories, and land districts, etc.—Continued.

COLORADO—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Leadville	Chaffee	642,651		
	Eagle	a 82,992		
	El Paso	b 50,397		
	Gunnison	c 41,729		
	Lake	184,215		
	Park	1,015,765		
	Pitkin	e 81,022		
	Summit	a 169,788		
Total				2,270,565
Montrose	Delta	311,279	69,120	d 380,399
	Dolores	40,380		e 40,380
	Mesa	861,352	636,272	e 1,550,624
	Montrose	935,137	345,600	d 1,280,737
	Ouray	144,303		e 144,303
	San Miguel	600,584	69,120	e 669,704
Total		2,806,035	1,170,112	4,066,147
Pueblo	Bent	f 84,200		
	Custer	320,642		
	Elbert	g 192,500		
	El Paso	h 637,000		
	Fremont	635,515		
	Huerfano	581,001		
	Kiowa	i 74,000		
	Las Animas	j 861,532		
	Otero	929,450		
	Pueblo	780,000		
Total				5,116,700
Total in Colorado		34,354,550	5,648,896	39,994,446

FLORIDA.

Gainesville	Alachua	42,290		
	Baker	3,160		
	Bradford	4,720		
	Brevard	86,299		
	Calhoun	90,800		
	Citrus	14,880		
	Clay	32,590		
	Columbia	7,770		
	Dade	97,360	i 2,119,680	2,217,000
	De Soto	124,380		
	Duval	2,280		
	Escambia	78,100		
	Gadsden	12,100		
	Hamilton	9,373		
	Hernando	7,920		
	Hillsborough	2,120		
	Holmes	33,240		
	Jackson	78,100		
	Jefferson	2,510		
	Lafayette	52,140		
	Lake	48,610		
	Lee	215,735	i 529,920	745,655
	Leon	7,882		
	Levy	40,720		
	Madison	15,372		
	Manatee	17,280		
	Marion	146,020		
	Monroe	17,884	i 691,200	709,084

a See Central City district.

b Total in Leadville and Pueblo districts, 687,397 acres.

c See Glenwood Springs district.

d See Gunnison district.

e See Durango district.

f See Lamar district.

g See Denver district.

h See Leadville district.

i Undoubtedly nearly all the unsurveyed land is swamp, and much of it is selected by, or patented to, the State as swamp.

Statement by States, Territories, and land districts, No.—Continued.

FLORIDA—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		Acres.	Acres.	Acres.
Gainesville.....	Nassau.....	4,320		
	Orange.....	33,000		
	Ocala.....	12,672		
	Polk.....	2,200		
	Putnam.....	21,620		
	St. John's.....	19,100		
	Santa Rosa.....	213,040		
	Sumter.....	820		
	Suwannee.....	2,200		
	Taylor.....	144,000		
	Volusia.....	22,680		
	Washington.....	284,800		
	Walton.....	263,820		
Total in the district and State.....		2,283,020	3,310,800	5,624,420

IDAHO.

Blackfoot.....	Bear Lake.....	282,880	15,200	298,080
	Bingham.....	795,680	696,650	1,492,330
	Oneida.....	507,724	115,200	622,924
Total.....		1,586,284	827,050	2,413,334
Boise City.....	Ada.....	447,300	640,000	1,087,300
	Boise.....	21,040	2,740,000	2,761,040
	Elmore.....	231,280	765,000	996,280
	Idaho.....	3,840	1,200,000	1,203,840
	Owyhee.....	707,300	3,620,000	4,327,300
	Washington.....	295,680	1,280,000	1,575,680
Total.....		1,707,000	9,725,000	11,432,000
Coeur d'Alene.....	Kootenai.....	50,100	1,057,000	1,107,100
	Shoshone.....	6,412	943,000	949,412
Total.....		56,512	2,000,000	2,056,512
Hailey d.....		266,600	18,200,000	18,466,600
Lewiston.....	Idaho.....	47,713	11,105,280	11,152,993
	Latah.....	6,300	720,480	726,780
	Nez Percé.....	25,000	151,280	176,280
	Shoshone.....	182,730	2,730,000	2,912,730
Total.....		261,803	12,306,960	12,528,763
Total in Idaho.....		3,928,277	43,019,013	46,957,290

IOWA.

Des Moines.....		2,000	63,000	65,000
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KANSAS.

Garden City.....	Clark.....	12,000		
	Finney.....	68,820		
	Ford.....	2,717		
	Garfield.....	6,680		

a See also note under head of the Hailey district as to Elmore County.

b Total in Idaho County in Boise City and Lewiston districts, 12,428,823 acres.

c Total in Shoshone County in Coeur d'Alene and Lewiston districts, 1,803,063 acres.

d The district officers say: "Hailey district contains about 18,000,000 acres, about 800,000 acres of which have been surveyed, mostly in Logan, Elmore, Altura, and Lemhi counties. About two-thirds of the surveyed land has been settled upon and improved. About 15 to 20 per cent of the land in this district could be irrigated if water could be procured from the larger streams of the State."

e See Boise City district. Unserved lands composed of mountain, prairie and timber land.

f One-half of the unsurveyed land is mountainous and heavily timbered.

g The most of the unsurveyed land is rough broken prairie.

h See Coeur d'Alene district. The unsurveyed land is mostly covered with timber.

i About 1,000 acres of the unsurveyed lands are accretions along the Missouri River, and about 2,000 acres are in dried-up lake-beds.

Statement by States, Territories, and land districts, etc.—Continued.

KANSAS—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Garden City	Grant.....	16,280		
	Gray.....	21,400		
	Hamilton.....	51,841		
	Hodgeman.....	9,200		
	Haskell.....	18,300		
	Kearney.....	76,240		
	Meade.....	56,500		
	Morton.....	52,871		
	Seward.....	58,770		
	Stanton.....	10,000		
	Stevens.....	41,300		
Total				508,739
Kirwin ^a		20,000		20,000
Larned ^b	Cheyenne.....	50,768		
Oberlin	Decatur.....	800		
	Norton.....	40		
	Rawlins.....	10,389		
	Sheridan.....	^c 160		
	Sherman.....	^d 1,240		
	Thomas.....	^e 1,200		
Total				64,807
Salina	Russell.....	^f 500		500
Topeka ^g	Ellis.....	13,712		
WaKeeney	Gove.....	21,529		
	Graham.....			
	Greeley.....	10,860		
	Lane.....	6,440		
	Logan.....	82,706		
	Neos.....	1,480		
	Rooks.....	2,320		
	Rush.....	160		
	Scott.....	10,680		
	Sheridan.....	^h 920		
	Sherman.....	ⁱ 6,480		
	Thomas.....	^j 320		
	Trego.....	9,248		
	Wallace.....	41,450		
	Wichita.....	3,640		
Total				161,845
Total in Kansas				756,791

LOUISIANA.

Natchitoches	Bienville.....	^j 25,040		
	Boisier.....	49,170		
	Caddo.....	27,529		
	Claiborne.....	^k 2,260		
	Grant.....	14,560		
	Natchitoches.....	83,885		
	Rapides.....	^m 5,532		

^a No land in the district subject to entry, except that there may be a few isolated tracts.^b The officers report it impracticable to make a statement by counties in the short time at their command in the present condition of their records, but they have approximated the quantity of vacant land in the entire district.^c Total in Oberlin and WaKeeney districts, 1,080 acres.^d Total in Oberlin and WaKeeney districts, 7,720 acres.^e Total in Oberlin and WaKeeney districts, 1,520 acres.^f Reported scarcely fit for grazing.^g Officers report that they do not believe that one entire section of vacant land in the district could be found by a "line by line search of the tract books."^h See Oberlin district.ⁱ This total may be increased by the expiration of filings.^j Total in Natchitoches and New Orleans districts, 39,280 acres.^k Total in Natchitoches and New Orleans districts, 6,780 acres.^l Total in Natchitoches and New Orleans districts, 65,500 acres.^m Total in Natchitoches and New Orleans districts, 42,662 acres.

Statement by States, Territories, and land districts, etc.—Continued.

LOUISIANA—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Natchitoches	Red River	11, 188		
	Sabine	63, 247		
	Vernon	836, 792		
	Wichster	29, 870		
	Winn	8 15, 560		
Supplemental list not reported by counties		6, 060		
Total		417, 791	8 115, 393	533, 184
New Orleans	Ascension d			
	Assumption	183		
	Avoyelles	2, 400		
	Acadia	1, 040		
	Blenville	8 14, 240		
	Calcasieu	134, 000		
	Cameron	1, 000		
	Caldwell	61, 430		
	Carabona	98, 300		
	Claborne	8 4, 526		
	East Baton Rouge	3, 800		
	East Carroll	820		
	East Feliciana	3, 836		
	Franklin	2, 707		
	Grant	8 60, 040		
	Iberia	2, 300		
	Jackson	30, 000		
	Jefferson	2, 000		
	Lincoln	3, 240		
	Livingston	715, 000		
	Morehouse	13, 300		
	Madison	180		
	Orachita	32, 000		
	Plaquemine	6, 070		
	Pointe Coupee	173		
	Rapides	8 27, 120		
	Richland	800		
	St. Bernard	2, 300		
	St. Helena	2, 820		
	St. Landry	40, 000		
	St. Martin	1, 700		
	St. Mary's	500		
	St. Tammany	31, 000		
	Tangipahoa	20, 000		
	Texas	200		
	Terrebonne	2, 000		
	Union	30, 200		
	Vermillion	530		
	Vernon	8 31, 000		
	Washington	28, 000		
	West Carroll	1, 250		
	West Feliciana	8 20		
	Winn	8 104, 890		
Total				823, 060
Total in Louisiana		1, 243, 400	115, 393	1, 358, 793

a Total in Natchitoches and New Orleans districts, 130, 293 acres.

b Total in Natchitoches and New Orleans districts, 119, 959 acres.

c The unsurveyed lands in Natchitoches district were not reported by parishes. These lands undoubtedly are mostly dried-up lakes, or such as are subject to overflow or inundations.

d The district officers say in their report: "Pending the resurvey of certain townships situated in this parish, formerly reserved from entry because claimed to be embraced in the Houmas grant, and their restoration to the public domain under act of March 2, 1850, and the adjustment of the claim of the State of Louisiana, involving a large portion thereof, it is difficult to state with any degree of accuracy what quantity of such lands will accrue to the United States, but it is estimated that there will be found subject to entry in the parish about 60, 000 acres." This quantity is excluded from the table.

e See Natchitoches district.

f The district officers say: "Owing to the uncertainty as to the location of the back line of the McDemore and Fontenot claims, we refrain from including Tps. 8 and 9 S., R. 5 E., and Tps. 8 and 9 S., R. 6 E., former S. E. Dist., east of river, but it is estimated that about 2, 300 acres will be found in these townships subject to entry and filing after location of said claims and approval of State seismons."

Statement by States, Territories, and land districts, etc.—Continued.

MICHIGAN.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Grayling	Alcona	8,100		
	Alpena	5,040		
	Benzie	3,300		
	Crawford	22,500		
	Grand Traverse	3,000		
	Isabella	3,800		
	Iscro	37,300		
	Mason	3,240		
	Montmorency	20,500		
	Newaygo	2,500		
	Ogemaw	2,400		
	Oscoda	44,900		
	Otsego	3,000		
	Presque Isle	11,000		
	Roscommon	7,100		
	(a)	8,600		
Total				192,000
Marquette	Alger	13,285		
	Baraga	830,087		
	Chippewa	104,614		
	Delta	29,466		
	Gogebic	4,686		
	Houghton	90,903		
	Iron	31,413		
	Isle Royale	16,102		
	Keweenaw	2,139		
	Lapeer	23,250		
	Mackinac	16,608		
	Mackinaw	83,620		
	Marquette	9,140		
	Menominee	141,192		
	Ontonagon	28,524		
	Schoolcraft			
Total				4,639,907
Total in Michigan				832,707

MINNESOTA.

Crookston	Becker	46,080		46,080
	Clay	17,240		17,240
	Kittatin	301,680	506,840	808,520
	Marshall	92,100	69,120	161,220
	Norman			
	Polk	27,450	2,560	30,010
Total		574,660	578,560	1,153,210
Duluth	Aitkin	42,800		42,800
	Carlton	26,100		26,100
	Cook	434,356	138,240	572,596
	Hosea	79,640	239,400	319,040
	Lake	273,660	663,160	936,820
	St. Louis	690,499	852,480	1,542,979
Total		1,546,515	1,889,180	3,435,795
Marshall	Dakota	40		40
	Frederick	40		40
	Houston	40		40
	Lac qui Parle	40		40
	Lyon	40		40
	McLeod	40		40
	Murray	40		40
	Renville	40		40

a Scattered tracts in other counties in the district.

b In this county 49,762 acres are reserved for Indians exclusive of the quantity given as vacant.

c In this county 35 acres are reserved for Indians exclusive of the quantity given as vacant.

d There are also in land tract 8704 acres embraced in the forfeited land grant of the Ontonagon and Brule River Railroad and Marquette, Houghton and Ontonagon Railroad, now claimed by the Michigan Land and Iron Company.

e Total in Duluth, St. Cloud and Taylor's Falls districts, 132,938 acres.

f Total in Duluth and St. Cloud districts, 1,811,480 acres.

PAPERS ACCOMPANYING THE

Statement by States, Territories, and land districts, etc.—Continued.

MINNESOTA—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		Acres.	Acres.	Acres.
Marshall	Rock	22	.....	.....
	Sibley	40	.....	.....
	Watauga	200	.....	.....
	Winona	80	.....	.....
Total .....		.....	.....	802
St. Cloud	Atkins	54,970	.....	a 54,980
	Benton	350	.....	350
	Beltrami	69,880	207,360	277,240
	Cass	219,840	.....	219,840
	Crow Wing	17,360	.....	17,360
	Grant	120	.....	120
	Hubbard	61,880	.....	61,880
	Itasca	165,720	1,830,320	a 1,996,040
	Kandiyohi	200	.....	200
	Marathon	13,440	.....	13,440
	Otter Tail	2,980	.....	2,980
	Pope	80	.....	80
	Sherburne	130	.....	130
	Stearns	306	.....	306
	Stevens	440	.....	440
	Todd	5,240	.....	5,240
	Traverse	460	.....	460
	Wadena	56,660	.....	56,660
	Wilkin	2,180	.....	2,180
	Wright	40	.....	40
Total		671,916	1,843,680	2,515,596
Taylor's Falls	Atkins	a 35,158	.....	.....
	Isanti	620	.....	.....
	Kanabec	10,413	.....	.....
	Mille Lacs	9,358	.....	.....
	Pine	62,537	.....	.....
Total .....		.....	.....	108,091
Total in Minnesota		2,902,034	4,011,620	6,913,654

MISSISSIPPI

Jackson	Amite	13,400	.....	.....
	Attala	14,280	.....	.....
	Calhoun	560	.....	.....
	Carroll	2,840	.....	.....
	Choctaw	5,240	.....	.....
	Clarke	20,500	.....	.....
	Copiah	4,500	.....	.....
	Covington	83,320	.....	.....
	Franklin	22,000	.....	.....
	Greene	92,700	.....	.....
	Grenada	0,520	.....	.....
	Hancock	72,040	.....	.....
	Harrison	170,860	.....	.....
	Hinds	240	.....	.....
	Holmes	720	.....	.....
	Jackson	109,140	.....	.....
	Jasper	11,080	.....	.....
	Jefferson	1,610	.....	.....
	Jones	39,810	.....	.....
	Kemper	14,610	.....	.....
	Lauderdale	12,220	.....	.....
	Lawrence	22,840	.....	.....
	Leake	13,800	.....	.....
	Leflore	440	.....	.....
	Lincoln	5,640	.....	.....
	Lowndes	80	.....	.....
	Madison	240	.....	.....
	Martin	145,970	.....	.....
	Monroe	4,720	.....	.....
	Montgomery	7,860	.....	.....
	Neshoba	20,760	.....	.....
	Newton	0,830	.....	.....

a See Duluth district.

Statement by States, Territories, and land districts, etc.—Continued.

MISSISSIPPI—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Jackson	Noxubee	4,480		
	Oktibbeha	1,320		
	Pearl River	41,780		
	Perry	124,140		
	Pike	17,720		
	Rankin	13,200		
	Scott	10,040		
	Simpson	77,520		
	Smith	56,720		
	Tallahatchie	3,120		
	Washington	160		
	Wayne	53,300		
	Webster	8,020		
	Wilkinson	32,520		
	Winston	15,320		
	Yalobusha	560		
Total in district and State				1,407,480

MISSOURI.

Boonville	Benton	19,000		
	Camden	130,000		
	Cedar	a 1,000		
	Crawford	3,800		
	Dallas	b 34,800		
	Hickory	20,000		
	Laclede	c 30,600		
	Marion	5,600		
	Miller	10,200		
	Morgan	500		
	Phelps	3,200		
	Polk	a 2,000		
	Pulaski	a 37,000		
	St. Clair	12,000		
	Vernon d			
Total		257,830		309,700
Ironton				e 257,830
Springfield	Barry	40,280		
	Cedar f			
	Dallas	f 5,000		
	Douglas	50,000		
	Laclede	f 10,000		
	McDonald	51,980		
	Newton	1,200		
	Ozark	100,000		
	Polk f			
	Pulaski f			
	Stone	91,473		
	Taney	200,000		
	Texas	12,000		
	Vernon f			
	Webster	6,000		
	Wright	10,000		
Total				583,933
Total in Missouri				1,151,463

a There is no vacant land in that portion of this county in the Springfield district.

b Total in Boonville and Springfield districts, 39,800 acres.

c Total in the Boonville and Springfield districts, 40,600 acres.

d No vacant land in either the Boonville or Springfield district.

e The district officers report it impracticable to report areas by counties. Of the total area in the district, 77,900 acres are in the townships east of the fifth principal meridian, and 179,930 acres are in those west thereof.

f See Boonville district.

Statement by States, Territories, and land districts, etc.—Continued.

MONTANA.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Bozeman.....	Gallatin.....	113,370	543,300	656,670
	Jefferson.....	34,230	34,660	68,890
	Madison.....	28,690	113,700	142,390
	Park.....	382,150	1,341,000	1,723,150
	Yellowstone.....	338,770	215,680	554,450
Total.....		894,610	2,252,800	3,147,410
Helena.....	Beaver Head.....	391,600	2,349,000	2,740,600
	Cascade.....	426,300	604,500	1,030,800
	Choteau.....	2,167,200	29,704,740	31,871,940
	Deer Lodge.....	275,980	1,580,200	1,856,180
	Fergus.....	2,044,800	1,128,000	3,172,800
	Gallatin.....		3,660	3,660
	Jefferson.....	123,500	254,600	378,100
	Lewis and Clarke.....	178,380	475,000	653,380
	Madison.....	358,000	980,200	1,338,200
	Meagher.....	590,540	1,074,800	1,665,340
	Missoula.....	122,600	7,014,440	7,137,040
	Park.....	38,400	8,000	46,400
	Silver Bow.....	77,000	173,000	250,000
	Yellowstone.....	203,200	107,360	310,560
Total.....		7,042,260	37,889,800	44,932,060
Miles City &.....		41,674,463	115,053,712	156,728,175
Total in Montana.....		11,116,724	49,943,612	61,060,336

NEBRASKA.

Alliance.....	Box Butte.....	4130,400		
	Cheyenne.....	7540,540		
	Deuel.....	6310,400		
	Scott's Bluff.....	2210,440		
	Sheridan.....	460,640		
	Sioux.....	450,100		
Total.....				2,207,680

a Total in Bozeman and Helena districts, 680,230 acres.

b Total in Bozeman and Helena districts, 456,800 acres.

c Total in Bozeman and Helena districts, 1,191,110 acres.

d Total in Bozeman and Helena districts, 1,707,820 acres.

e Total in Bozeman and Helena districts, 310,600 acres. There is also an area of 649,600 acres of this county in the Miles City district, but the area of the entries, which cannot be large, has not been reported.

f See Bozeman district.

g See Bozeman district and note under head of Miles City district.

h It was not found practicable to apportion the entries to the different counties, namely, Meagher, Choteau, Yellowstone, Dawson, and Custer, because when the office was opened the district was all within Custer county, and many entries were made before its subdivision.

i Deducting lands listed to the Northern Pacific Railroad Company and for university purposes and the school sections, and there remain 1,913,574 acres of surveyed land, from which amount one-eighth, or 239,209 acres, is deducted as filed upon or entered, leaving 1,674,365 acres as subject to entry.

j From 4,082,240 acres estimated by this office to be the total quantity within the granted or forty-mile limits of the Northern Pacific Railroad in the district, the quantity listed to the company, to wit, 1,114,132 acres, is deducted, leaving 2,968,048 acres as approximating the quantity unsurveyed within said limits; and deducting the last quantity from 12,021,760 acres, estimated by the district officers to be the total quantity unsurveyed in the district, and there remain 13,053,712 acres as the area of unsurveyed land subject to settlement. The school sections are not deducted, as they are subject to settlement at any time before survey in the field, but undoubtedly nearly of them will inure to the State under the school grant when surveyed, thus reducing the area that then will be subject to settlement and entry.

k Total in Alliance and Chadron districts, 145,640 acres.

l Total in Alliance and Sidney districts, 643,260 acres.

m Total in Alliance and Sidney districts, 783,280 acres.

n Total in Alliance and Sidney districts, 254,240 acres.

o Total in Alliance and Chadron districts, 794,900 acres.

p Total in Alliance and Chadron districts, 970,200 acres.

Statement by States, Territories, and land districts, etc.—Continued

NEBRASKA—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Broken Bow	Arthur	a 203,520		
	Blaine	269,260		
	Brown	b 154,800		
	Cherry	c 608,640		
	Custer	d 125,440		
	Grant	360,168		
	Hooker	390,800		
	Logan	e 158,640		
	McPherson	f 237,440		
	Thomas	384,000		
Total				g 2,932,700
Chadron	Box Butte	h 26,240		
	Dawes	126,880		
	Sheridan	h 328,356		
	Sioux	h 520,040		
Total				1,001,510
Grand Island	Adams	18		
	Buffalo	275		
	Custer	i 680		
	Dawson	j 14		
	Greeley	14,296		
	Hall	35		
	Merrick	83		
	Platte	40		
	Polk	8		
	Sherman	79		
	Valley	2,453		
Total				17,980
McCook	Chase	57,894		
	Dundy	108,180		
	Frontier			
	Hayes	22,000		
	Hitchcock			
	Red Willow			
Total				188,074
Neligh	Antelope	10,560		
	Garfield	162,400		
	Holt	k 32,320		
	Loup	215,960		
	Rock	l 62,720		
	Wheeler	14,300		
Total				499,280
North Platte	Arthur	m 298,860		
	Custer	n 24,580		
	Dawson	n 680		
	Frontier	o 160		
	Gasper	100		
	Keith	p 171,880		

a Total in Broken Bow and North Platte districts, 502,380 acres.

b Total in Broken Bow and Valentine districts, 404,800 acres.

c Total in Broken Bow and Valentine districts, 838,640 acres.

d Total in Broken Bow, Grand Island, and North Platte districts, 150,700 acres.

e Total in Broken Bow and North Platte districts, 181,440 acres.

f Total in Broken Bow and North Platte districts, 397,360 acres.

g This total is exclusive of townships 17, 18, 19, and 20, of ranges 17, 18, 19, and 20, in Custer County, the plats of which had not been received from Grand Island land office when report of the district officers at Broken Bow was made.

h See Alliance district.

i Total in Grand Island and North Platte districts, 674 acres.

j See North Platte district.

k Total in Neligh and O'Neill districts, 147,320 acres.

l Total in Neligh and Valentine districts, 247,720 acres.

m See Broken Bow district.

n See Grand Island district.

o See McCook district.

p Total in North Platte and Valentine districts, 230,600 acres.

Statement by States, Territories, and land districts, etc.—Continued.

NEBRASKA—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
North Platte	Lincoln	a 401, 000		
	Logan	a 23, 440		
	McPherson	a 139, 940		
	Parkinson	4, 140		
Total				1, 053, 700
O'Neill	Holt	b 115, 400		115, 000
Sidney	Banner	c 69, 520		
	Cherokee	c 102, 720		
	Deuel	c 172, 000		
	Keith	d 56, 240		
	Kimball	145, 000		
	Scott's Bluff	e 41, 800		
Total				781, 700
Valentine	Brown	a 250, 000		
	Cherry	a 1, 000, 000		
	Keosauqua	60, 000		
	Rock	b 285, 000		
Total				2, 505, 000
Total in Nebraska				11, 230, 584

NEVADA.

Carson City	Churchill	1, 123, 672	1, 375, 247	a 2, 043, 789
	Douglas	218, 144	69, 970	f 343, 241
	Elko	80, 422	1, 200	g 81, 622
	Esmeralda	1, 606, 769	1, 030, 842	h 2, 637, 610
	Humboldt	2, 006, 967	0, 171, 024	i 2, 178, 000
	Lander	324, 382	493, 341	j 817, 723
	Lyon	390, 141	540, 849	k 931, 000
	Nye	424, 000	255, 040	l 679, 040
	Ormsby	28, 836	18, 000	m 46, 836
	Storey	49, 555	90, 000	n 139, 555
	Washoe	1, 641, 760	1, 350, 154	o 2, 991, 914
Total		9, 256, 977	12, 684, 560	21, 941, 537
Eureka	Elko	5, 491, 012	945, 200	p 6, 436, 212
	Eureka	975, 057	481, 872	q 1, 456, 929
	Lander	344, 942	603, 110	r 948, 052
	Lincoln	4, 871, 685	5, 211, 626	s 10, 083, 311
	Nye	2, 798, 156	3, 710, 000	t 6, 508, 156
	White Pine	2, 377, 738	387, 865	u 2, 765, 603
Total		18, 060, 190	10, 962, 813	29, 023, 003
Total in Nevada		27, 317, 167	23, 647, 373	50, 964, 540

a See Broken Bow district.

b See Neligh district.

c See Alliance district.

d See North Platte district.

e This total embraces also 41,000 acres of mineral land.

f This total embraces also 55,118 acres of mineral land.

g The entire area of vacant land in Carson City and Eureka districts aggregates 6,518,454 acres.

h This total includes also 87,883 acres of mineral land.

i This total embraces also 27,998 acres of mineral land.

j This total embraces also 5,205 acres of mineral land.

k This total embraces also 22,653 acres of mineral land.

l This total embraces also 53,901 acres of mineral land. The entire area in Carson City and Eureka

districts aggregates 7,777,238 acres.

m This total embraces also 12,300 acres of mineral land.

n This total embraces also 2,000 acres of mineral land.

o This total embraces also 24,583 acres of mineral land.

p See Carson City district.

Statement by States, Territories, and land districts, etc.—Continued.

NEW MEXICO.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Folsom	Colfax	a 1,813,960		
	Lincoln	b 250,560		
	Mora	a 1,271,360		
	San Miguel	a 3,527,460		
Total		6,863,360	c 490,810	7,369,200
Las Cruces	Dona Ana	3,743,360	1,707,120	5,510,480
	Grant	3,307,520	2,246,400	5,653,920
	Sierra	1,377,920	46,060	1,424,000
	Socorro	5,010,640	1,354,880	d 6,365,520
Total		13,460,440	5,444,460	18,913,020
Roswell	Lincoln	8,303,820	6,000,680	e 15,333,500
Santa Fé	Bernalillo	1,424,592	601,200	2,125,792
	Colfax	250,003	92,160	f 342,163
	Mora	398,776	276,480	g 675,256
	Rio Arriba	1,117,048	990,720	2,107,668
	San Juan	1,111,368	576,000	1,687,368
	San Miguel	1,711,350	220,400	h 1,947,750
	Santa Fé	1,871,504	46,060	i 1,917,564
	Socorro	1,236,962	69,120	j 1,326,082
	Taos	301,844	345,600	k 647,444
	Valencia	2,467,710	437,760	2,903,470
Total		10,928,186	3,755,520	14,683,706
Total in New Mexico		30,690,806	16,699,520	60,380,326

NORTH DAKOTA.

Bismarck	Allred	163,840	92,120	255,960
	Billings	471,010	1,198,080	1,669,120
	Bowman	348,160	737,280	1,085,440
	Buford	942,080	942,080	1,884,160
	Burleigh	285,560		285,560
	Dunsmuir	358,400	322,560	680,960
	Eddy g	960		960
	Emmons	237,060		237,060
	Flannery	1,187,840	1,187,840	2,375,680
	Foster h	3,820		3,820
	Garfield	20,200	20,200	40,400
	Hettinger	621,600	1,382,400	2,007,040
	Kidder	263,120		263,120
	Logan	220,800		220,800
	Mecor	184,480	207,360	391,840
	McIntosh	178,060		178,060
	McKenzie	368,640	668,160	1,036,800
	McLean	96,160		96,160
	Montraille	810,200	810,200	1,620,400
	Morton	738,520	1,632,000	2,390,520
	Oliver	159,840		159,840
	Renville	614,400	614,400	1,228,800
	Sheridan	311,720	437,760	759,520
	Stark	175,680	270,480	446,160
	Stevens	737,280	737,280	1,474,560
	Stutsman i	216,200	23,040	239,240
	Villard	474,560	1,105,920	1,580,480
	Wallace	85,640	85,640	171,280
	Ward	473,440	506,880	980,320

a See Santa Fé district.

b See Roswell district.

c The unsurveyed lands in this district were not stated by counties in the report of the district officers. They form a strip—the east boundary of the Territory about 100 miles long and 4 miles wide.

d Total in Las Cruces and Santa Fé districts, 7,721,602 acres.

e See Folsom district.

f See Las Cruces district.

g Total in Bismarck, Devil's Lake, and Fargo districts, 67,360 acres.

h Total in Bismarck and Fargo districts, 57,520 acres.

i Total in Bismarck and Fargo districts, 309,840 acres.

Statement by States, Territories, and land districts, etc.—Continued.

NORTH DAKOTA—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Bismarck.....	Wells a.....	183,680	161,293	344,973
	Williams.....	317,440	408,800	726,240
	Wynn.....	286,240	266,240	552,480
Total.....		11,540,580	12,915,000	24,455,580
Devil's Lake.....	Benson c.....	220,000	276,000	496,000
	Bo. Liman.....	208,000	292,500	500,500
	Church.....	68,000	575,000	643,000
	Eddy d.....	36,000	.....	36,000
	McHenry.....	555,000	210,000	765,000
	Pierce.....	400,000	138,000	538,000
	Ramsey e.....	21,000	.....	21,000
	Rolette.....	210,000	83,500	293,500
	Towner.....	230,000	270,000	500,000
	Weiland.....	165,000	48,000	213,000
Total.....		2,101,000	1,012,000	3,113,000
Fargo.....	Barnes.....	16,200	.....	16,200
	Cass.....	400	.....	400
	Dickey.....	60,800	.....	60,800
	Eddy d.....	30,400	.....	30,400
	Foster d.....	54,000	.....	54,000
	Griggs.....	28,400	.....	28,400
	La. Moure.....	22,600	.....	22,600
	Ransom.....	18,300	.....	18,300
	Richland.....	22,700	.....	22,700
	Sargent.....	5,800	.....	5,800
	Steele.....	720	.....	720
	Stutsman d.....	71,000	.....	71,000
Total.....		.....	.....	318,000
Grand Forks.....	Benson f.....	29,840	.....	29,840
	Cavalier.....	154,400	138,000	292,400
	Grand Forks.....	.....	.....	.....
	Neison.....	42,640	.....	42,640
	Pembina.....	.....	.....	.....
	Ramsey f.....	21,500	92,000	113,500
	Walsh.....	29,800	25,000	54,800
	Unorganized country.....	50,520	92,000	142,520
Total.....		378,820	345,000	723,820
Total in North Dakota.....		14,318,400	10,170,000	24,488,400

OKLAHOMA.

Guthrie.....	No. 1 g.....	.....	.....	.....
	No. 2.....	45,300	.....	45,300
	No. 3.....	45,220	.....	45,220
	No. 6.....	240	.....	240
Total.....		.....	.....	11,520
Kingfisher.....	No. 1.....	7177	.....	7177
	No. 2.....	729	.....	729
	No. 3.....	7110	.....	7110
	No. 4.....	1,132	.....	1,132
	No. 5.....	9,555	.....	9,555
Total.....		.....	.....	10,503
Total in Oklahoma.....		22,053	43,672,640	3,694,693

a Total in Bismarck and Devil's Lake districts, 356,990 acres.

b Besides this quantity, there is considerable land within the indemnity limits of the Northern Pacific Railroad, but it is probable that it will all be needed to satisfy the grant of indemnity to said road.

c Total in Devil's Lake and Grand Forks districts, 535,840 acres.

d See Bismarck district.

e Total in Devil's Lake and Grand Forks districts, 140,500 acres.

f See Devil's Lake district.

g See Kingfisher district.

h Total in Guthrie and Kingfisher districts, 5,399 acres.

i Total in Guthrie and Kingfisher districts, 6,610 acres.

j See Guthrie district.

k The unsurveyed lands in Oklahoma are in the "Public Land Strip."

REPORT OF THE SECRETARY OF THE INTERIOR.

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Statement by States, Territories, and land districts, etc.—Continued.

OREGON.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Burns.....	Baker.....	239,258	37,057	a 276,315
	Crook.....	171,120	.....	b 171,120
	Grant.....	1,183,826	233,074	c 1,416,900
	Harney.....	2,376,069	580,160	d 2,956,229
	Malheur.....	1,932,123	1,302,720	e 3,234,843
	Total.....	5,904,896	2,013,911	7,917,907
La Grande.....	Baker.....	766,983	225,606	f 992,589
	Grant.....	1,385,516	14,080	g 1,399,596
	Morrow.....	227,273	.....	h 227,273
	Union.....	1,077,799	371,100	i 1,448,899
	Umatilla.....	438,402	96,520	j 534,922
	Wallowa.....	635,600	799,988	k 1,435,588
Lakeview.....	Total.....	4,501,573	1,507,288	6,008,861
	Crook.....	1,114,716	286,060	l 1,400,776
	Klamath.....	1,298,393	396,000	m 1,694,393
	Harney.....	1,443,629	572,000	n 2,015,629
	Lake.....	2,636,187	704,000	o 3,340,187
	Malheur.....	1,066,808	968,000	p 1,974,808
Oregon City.....	Total.....	7,489,733	2,936,000	10,425,733
	Benton.....	70,640	121,600	q 192,240
	Clackamas.....	84,160	460,640	r 544,800
	Clatsop.....	35,876	288,000	s 323,876
	Columbia.....	29,180	30,000	t 59,180
	Lincoln.....	58,000	500,840	u 558,840
Roseburg.....	Marion.....	13,820	606,880	v 620,700
	Multnomah.....	3,520	60,000	w 63,520
	Polk.....	25,320	69,120	x 94,440
	Tillamook.....	173,406	253,440	y 426,846
	Washington.....	18,000	57,600	z 75,600
	Yamhill.....	26,720	.....	aa 26,720
The Dalles.....	Total.....	489,680	2,354,160	2,843,840
	Benton.....	23,860	38,720	ab 62,580
	Coos.....	184,000	396,537	ac 580,537
	Curry.....	107,640	706,750	ad 814,390
	Douglas.....	328,130	1,479,800	ae 1,807,930
	Jackson.....	374,310	374,480	af 748,790
Total.....	Josephine.....	81,200	769,000	ag 850,200
	Klamath.....	10,900	231,470	ah 242,370
	Lane.....	415,230	1,420,500	ai 1,835,730
	Linn.....	24,780	315,520	aj 340,300
	Total.....	1,554,060	6,733,687	7,287,747
The Dalles.....	Crook.....	2,000,640	58,000	f 2,058,640
	Gilliam.....	236,700	17,000	g 253,700
	Grant.....	261,400	15,000	h 276,400
	Morrow.....	293,100	2,600	i 295,700
	Sherman.....	38,000	.....	j 38,000
	Wasco.....	560,000	257,600	k 817,600
Total.....	Total.....	3,409,840	350,100	3,759,940
	Total in Oregon.....	23,378,982	14,894,246	38,273,228

- a Total in Burns and La Grande districts, 1,268,900 acres.
b Total in Burns, Lakeview and The Dalles districts, 3,650,476 acres.
c Total in Burns, La Grande, and The Dalles districts, 3,094,896 acres.
d Total in Burns and Lakeview districts, 4,771,258 acres.
e Total in Burns and Lakeview districts, 5,270,1 acres.
f See Burns district.
g Total in La Grande and The Dalles districts, 522,873 acres.
h Total in Lakeview and Roseburg districts, 1,937,423 acres.
i Total in Oregon City and Roseburg districts, 254,820 acres.
j Total in Oregon City and Roseburg districts, 905,780 acres.
k See Oregon City district.
l See Lakeview district.
m See La Grande district.
n In addition to this total the officers report 1,457,000 acres within the granted limits of Northern Pacific Railroad as liable to forfeiture.

Statement by States, Territories, and land districts, etc.—Continued.

SOUTH DAKOTA.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Abundance.....	Brown.....	2,090		
	Campbell.....	109,570		
	Edmunds.....	85,480		
	McPherson.....	160,560		
	Walworth.....	85,640		
Total.....				437,290
Chamberlain.....	Beale.....	27,614		27,614
	Butte.....	24,560		24,560
	Gregory.....		138,240	138,240
	Jackson.....		391,680	391,680
	Nowlin.....		441,280	441,280
	Lynn.....	802	108,608	109,410
	Pratt.....		570,240	570,240
	Presidio.....	19,235	395,488	414,723
	Stanley.....		31,680	31,680
Total.....		72,111	2,077,244	2,149,355
Huron.....	Beadle.....	1,419		
	Frank.....	22,470		
	Haad.....	45,872		
	Hyde.....	117,854		
	Potter.....	79,445		
	Spink.....	496		
	Sully.....	37,455		
Total.....				304,091
Mitchell.....				c 1,000
Pierre.....	Hughes.....	100,937		
	Nowlin.....		d 368,640	
	Pyatt.....		93,100	
	Stanley.....		d 645,120	
	Sterling.....		552,960	
Total.....		100,937	1,658,880	1,759,817
Rapid City.....	Butte.....	170,525	460,000	630,525
	Burdick (unorganized).....		690,000	690,000
	Custer.....	157,080	437,000	594,080
	Ewing (unorganized).....		575,000	575,000
	Fall River.....	250,800	698,000	948,800
	Harding (unorganized).....		690,000	690,000
	Lawrence.....	35,300	345,000	380,300
	Meade.....	127,140	207,000	334,140
	Pennington.....	194,650	460,000	654,650
Total.....		1,036,425	4,402,000	5,438,425
Watertown.....	Brookings.....	120		
	Clark.....	0,540		
	Codington.....	8,153		
	Day.....	12,741		
	Deuel.....	2,300		
	Grant.....	6,540		
	Hamlin.....	500		
	Marshall.....	9,296		
	Roberts.....	1,030		
Total.....				45,290
Yankton.....	Charles Mix.....	5,400		5,400
Total in South Dakota.....		2,043,374	8,108,124	10,251,498

a Total in Chamberlain and Pierre districts, 800,000 acres.

b Total in Chamberlain and Pierre districts, 870,800 acres.

c The officers report only a few isolated tracts vacant in the entire district, not aggregating more than about 1,000 acres.

d See Chamberlain district.

Statement by States, Territories, and land districts, etc.—Continued.

UTAH.

Land district.	County.	Surveyed Land.	Unsurveyed Land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Salt Lake City	Bever	338,600	1,700,000	2,038,600
	Box Elder	495,700	2,500,000	2,995,700
	Cache	100,000	158,000	258,000
	Davis	11,500	700,000	711,500
	Emery	461,600	2,300,000	2,761,600
	Garfield	216,700	2,300,000	2,516,700
	Iron	587,300	1,920,000	2,507,300
	Jnab	710,000	1,500,000	2,210,000
	Kane	379,300	1,610,000	1,989,300
	Millard	1,198,000	2,500,000	3,698,000
	Morgan	62,200	500,000	562,200
	Pi Ute	224,500	1,380,000	1,604,500
	Rich	202,000	7,000	209,000
	Salt Lake	3,200	130,000	133,200
	San Peto	128,700	860,000	988,700
	Sevier	216,100	1,460,000	1,676,100
	Summit	223,100	1,000,000	1,223,100
	Tooele	779,600	2,500,000	3,279,600
	Uintah	158,500	1,644,000	1,802,500
	Utah	186,800	1,000,000	1,186,800
	Wasatch	63,000	207,000	270,000
	Washington	189,500	1,000,000	1,189,500
	Weber	12,000	300,000	312,000
Total in district and Territory		7,029,100	29,176,000	36,205,100

WASHINGTON.

North Yakima	Douglas	973,161	115,200	1,088,361
	Kittitas	290,810	1,038,800	1,329,610
	Okanogan	284,180	2,995,200	3,279,380
	Yakima	496,620	921,600	1,417,420
Total		2,044,971	5,069,800	7,114,771
Seattle	Chehalis	4,801	379,040	383,841
	Clallam	3,621	690,037	703,458
	Island	120	.....	120
	Jefferson	1,608	710,095	711,703
	King	320	1,925,300	1,925,680
	Kitsap	432	.....	432
	Mason	9,774	189,120	198,894
	Pierce	400	276,480	276,880
	San Juan	1,020	.....	1,020
	Skagit	5,411	826,953	832,364
	Snohomish	880	838,240	839,220
	Thurston	720	.....	720
	Whatcom	4,673	1,354,680	1,359,563
Total		34,880	7,199,905	7,234,785
Spokane Falls	Adams	192,428	.....	192,428
	Lincoln	231,642	83,520	315,162
	Spokane	56,180	161,280	217,460
	Stevens	311,793	1,497,600	1,809,393
	Whitman	27,600	.....	27,600
Total		819,843	1,742,400	2,562,243
Vancouver	Chehalis	5,580	71,000	76,580
	Clarke	4,931	109,440	114,371
	Cowlitz	20,676	184,840	184,516
	Klickitat	216,016	65,920	281,936
	Lewis	23,539	256,000	279,529
	Skamania	17,513	279,060	297,193
	Pacific	22,742	108,560	131,302

a Total in North Yakima and Walla Walla districts, 1,467,600 acres.*b* Total in Seattle and Vancouver districts, 460,421 acres.*c* Total in Seattle and Vancouver districts, 319,440 acres.*d* Total in Seattle and Vancouver districts, 4,700 acres.*e* Total in Spokane Falls and Walla Walla districts, 248,848 acres.*f* Total in Spokane Falls and Walla Walla districts, 93,640 acres.*g* See Seattle district.

Statement by States, Territories, and land districts, etc.—Continued.

WASHINGTON—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		Acres.	Acres.	Acres.
Vancouver	Pierce	1,600	40,960	a 42,560
	Thurston	3,280		a 3,280
	Wahkiskum	29,460	10,240	a 39,700
Total		344,357	1,305,640	1,650,007
Walla Walla	Adams	51,420		51,420
	Anasim	98,240	57,600	155,840
	Columbia	25,140	155,520	180,660
	Franklin	317,480		317,480
	Garfield	18,900	101,280	120,180
	Klickitat	100,800		100,800
	Walla Walla	92,960		92,960
	Whitman	67,840		b 67,840
	Yakima	70,240		c 70,240
Total		905,120	274,400	1,179,520
Total in Washington		4,153,171	15,491,145	19,644,316

WISCONSIN.

Ashland	Ashland	d 50,000		
	Bayfield	52,000		
	Burnett	e 15,000		
	Douglas	85,000		
	Sawyer	f 20,000		
	Washburn	g 20,000		
Total				222,000
Eau Claire	Barren	2,610		
	Buffalo	2,205		
	Burnett	h 101,225		
	Clark	7,032		
	Chippewa	8,748		
	Crawford	720		
	Dunn	3,678		
	Eau Claire	2,610		
	Grant	160		
	Jackson	21,022		
	La Fayette	80		
	La Crosse	720		
	Monroe	10,147		
	Pepin	147		
	Pock	9,675		
	Plover	i 9,000		
	Richland	280		
	Sack	1,580		
	Sawyer	h 22,175		
	St. Croix	40		
	Taylor	j 10,610		
	Trempealeau	1,352		
	Vernon	750		
	Washburn	k 27,000		
Total				210,500
Menasha	Florence	9,040		
	Forest	l 2,200		
	Langlade	11,020		
	Marquette	37,840		
	Monroe	8,700		
	Shawano	440		
Total				68,200

a See Seattle district.

b See Spokane Falls district.

c See North Yakima district.

d Total in Ashland and Wausau districts, 55,000 acres.

e Total in Ashland and Eau Claire districts, 116,225 acres.

f Total in Ashland and Eau Claire districts, 42,175 acres.

g Total in Ashland and Eau Claire districts, 47,000 acres.

h See Ashland district.

i Total in Eau Claire and Wausau districts, 17,100 acres.

j Total in Eau Claire and Wausau districts, 10,000 acres.

k Total in Menasha and Wausau districts, 38,200 acres.

l Total in Menasha and Wausau districts, 11,020 acres.

Statement by States, Territories, and land districts, etc.—Continued.

WISCONSIN—Continued.

Land district.	County.	Surveyed land.	Unsurveyed land.	Total area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Wausau	Adams	7,500		
	Ashland	a 5,000		
	Forest	b 30,000		
	Juneau	2,000		
	Langlade	b 10,000		
	Lincoln	60,000		
	Marathon	1,500		
	Marquette	2,000		
	Oneida	150,000		
	Portage	2,000		
	Price	c 7,500		
	Shawano	1,000		
	Taylor	e 10,000		
	Washburn	2,000		
	Wood	5,000		
Total				285,500
Total in Wisconsin				819,320

WYOMING.

Buffalo	Converse	d 84,200		
	Crook	2,905,300		
	Fremont	e 813,000		
	Johnson	4,085,000		
	Natrona	d 55,000		
	Sheridan	1,345,300		
	Weston	2,624,100		
	Total	11,976,500	f 575,000	12,551,500
Evanston	Fremont	3,403,840	4,480,000	g 7,943,840
	Sweetwater	4,492,800	412,160	h 4,904,960
	Uinta	2,650,200	4,147,200	6,797,400
Total		10,606,840	9,039,360	19,646,200
Cheyenne	Albany	1,453,160	48,000	1,498,160
	Carbon	3,004,800	460,000	3,464,800
	Converse	3,546,880	48,500	i 3,593,380
	Fremont	636,880	920,000	j 1,556,880
	Laramie	2,922,880	23,000	2,945,880
	Natrona	2,873,780	322,000	3,195,780
	Sweetwater	557,500		k 557,500
	Total	14,994,860	1,817,500	16,812,360
Total in Wyoming		37,578,200	11,431,860	49,010,060

a See Ashland district.

b See Menasha district.

c See Eau Claire district.

d See Cheyenne district.

e See Evanston and Cheyenne districts.

f The unsurveyed lands in Buffalo district were not stated by counties in the report of the district officers.

g See Buffalo and Cheyenne districts.

h Total in Evanston and Cheyenne districts, 5,462,450 acres.

i See Buffalo district.

j See Buffalo and Evanston districts.

k See Evanston district.

RECAPITULATION OF VACANT LANDS IN THE PUBLIC LAND STATES AND TERRITORIES.

State or Territory.	Surveyed land.	Unsurveyed land.	Total.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Alabama.....	1,195,000		1,195,000
Arizona.....	11,981,626	37,715,420	49,697,046
Arkansas.....	4,967,329		4,967,329
California.....	38,700,501	15,172,144	53,872,645
Colorado.....	34,304,320	5,039,896	39,344,216
Florida.....	2,283,026	3,140,820	5,423,846
Idaho.....	3,008,277	43,013,013	46,021,290
Iowa.....	2,000	3,600	5,600
Kansas.....	755,791		755,791
Louisiana.....	1,218,460	115,899	1,334,359
Michigan.....	812,707		812,707
Minnesota.....	2,962,034	4,011,520	6,973,554
Mississippi.....	1,407,480		1,407,480
Missouri.....	1,151,163		1,151,163
Montana.....	9,011,315	55,199,312	64,210,627
Nebraska.....	11,220,284		11,220,284
Nevada.....	27,216,167	23,488,373	50,704,540
New Mexico.....	39,690,400	10,609,520	50,300,920
North Dakota.....	14,318,409	16,179,000	30,497,409
Oklahoma.....	21,053	33,672,640	33,693,693
Oregon.....	23,378,652	14,854,246	38,232,898
South Dakota.....	2,642,374	8,128,124	10,770,498
Utah.....	7,029,100	29,170,000	36,199,100
Washington.....	4,155,171	15,429,145	19,584,316
Wisconsin.....	819,320		819,320
Wyoming.....	37,676,700	11,431,860	49,108,560
In the United States.....	282,772,439	303,444,422	586,216,861

a The unsurveyed lands in Oklahoma are in the Public Land Strip.

b This aggregate is exclusive of title, Indiana, and Illinois, in which, if any public land remains, it consists of a few small isolated tracts; it is exclusive of the Cherokee Strip, containing 2,644,644 acres, and all other lands owned or claimed by the Indians in the Indian Territory west of the 90th degree of longitude, contemplated to be made a part of the public domain by the fourteenth section of the act of March 2, 1839 (25 U. S. Stat., 1005), and it is also exclusive of Alaska, containing 577,399 square miles, or 369,520,000 acres, of which not more than 1,000 acres have been entered under the mineral laws.

SWAMP LANDS.

Statement exhibiting the quantity of land selected for the several States under acts of Congress approved March 2, 1849, and September 23, 1850 (section 2479, Revised Statutes), and March 12, 1860 (section 2490, Revised Statutes), up to and ending June 30, 1890.

States.	1850.		1850.		Year ending June 30, 1890.	Total since date of grant.
	Third quarter.	Fourth quarter.	First quarter.	Second quarter.		
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Alabama.....						601,355.00
Arkansas.....						8,635,219.10
California.....						1,883,555.00
Florida.....		850.89	119.62		970.51	77,222,429.60
Illinois.....						8,981,784.10
Indiana.....						1,877,727.70
Iowa.....						4,507,970.00
Louisiana (act of 1818).....			182.18		182.26	11,214,286.52
Louisiana (act of 1850).....						234,429.51
Michigan.....						7,191,430.26
Minnesota.....			9,862.33	5,410.18	15,272.51	4,394,089.12
Mississippi.....						3,602,964.80
Missouri.....						4,842,589.24
Ohio.....						116,766.28
Oregon.....	2,330.90	470.25			2,801.15	470,671.80
Wisconsin.....						4,567,128.87
Total.....	2,330.90	1,320.14	9,842.35	5,410.18	19,216.51	80,218,419.21

Statement exhibiting the quantity of land approved to the several States under acts of Congress approved March 2, 1849, and September 28, 1850 (section 2479, Revised Statutes), and March 12, 1860 (section 2490, Revised Statutes), up to and ending June 30, 1890.

States.	1889.		1890.		Year ending June 30, 1890.	Total since date of grant.
	Third quarter.	Fourth quarter.	First quarter.	Second quarter.		
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Alabama	160.00	.....	.....	.....	160.00	414,310.31
Arkansas .....	.....	.....	.....	.....	.....	7,671,101.21
California	2,810.30	1,760.00	2,022.72	1,480.00	8,073.02	1,758,602.80
Florida	33,049.15	20,829.49	.....	5,220.92	59,099.56	16,277,310.54
Illinois .....	.....	.....	40.00	.....	40.00	1,482,718.25
Indiana .....	.....	.....	.....	.....	.....	1,285,107.87
Iowa .....	.....	.....	160.00	280.00	440.00	933,562.00
Louisiana (act of 1849) .....	.....	.....	.....	.....	.....	8,708,588.48
Louisiana (act of 1850) .....	.....	.....	.....	.....	.....	257,504.03
Michigan .....	.....	.....	.....	.....	.....	5,728,922.91
Minnesota .....	.....	.....	.....	.....	.....	2,055,092.46
Mississippi .....	.....	.....	406.54	.....	406.54	3,543,777.77
Missouri .....	.....	.....	.....	.....	.....	4,498,116.49
Ohio .....	.....	.....	.....	.....	.....	25,600.71
Oregon	9,958.64	25,997.73	808.38	4,011.15	40,865.85	243,993.85
Wisconsin .....	.....	17,905.52	.....	.....	17,905.52	3,340,132.99
Total	45,978.00	66,492.74	3,527.59	10,992.07	126,900.49	59,100,462.07

Statement exhibiting the quantity of land patented to the several States under the acts of Congress approved September 28, 1850 (section 2479, Revised Statutes), and March 12, 1860 (section 2490, Revised Statutes), and also the quantity certified to the State of Louisiana under act of March 2, 1849, up to and ending June 30, 1890.

States.	1889.		1890.		Year ending June 30, 1890.	Total since date of grant.
	Third quarter.	Fourth quarter.	First quarter.	Second quarter.		
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Alabama	999.42	.....	.....	.....	999.42	a111,189.26
Arkansas	2,156.38	1,326.64	.....	.....	3,483.02	7,647,709.36
California .....	.....	3,942.60	.....	120.00	4,062.60	1,469,460.25
Florida	617.01	38,819.17	14,159.60	.....	53,595.70	b16,114,725.74
Illinois .....	.....	.....	.....	40.00	40.00	c1,455,641.45
Indiana .....	.....	.....	.....	.....	.....	d1,257,863.05
Iowa	411.18	80.00	80.00	113.95	685.13	e1,183,920.33
Louisiana (act of 1849) .....	.....	.....	.....	.....	.....	8,708,588.53
Louisiana (act of 1850) .....	.....	.....	.....	2,948.17	2,948.17	f228,120.49
Michigan .....	.....	.....	.....	.....	.....	g5,667,304.64
Minnesota .....	.....	40.00	.....	45.56	85.56	2,890,502.21
Mississippi .....	.....	.....	406.54	.....	406.54	3,259,153.20
Missouri	3,222.28	80.00	680.00	.....	3,982.28	h3,415,531.27
Ohio .....	.....	.....	.....	.....	.....	25,640.71
Oregon	215.84	.....	32,933.68	2,935.70	36,085.22	140,982.80
Wisconsin .....	.....	.....	2,977.87	.....	2,977.87	i3,332,900.51
Total	7,622.11	44,288.71	51,237.69	6,203.38	109,351.89	57,209,324.40

a 1,998.64 acres of this is contained in indemnity patents under act of March 2, 1855.
b 56,861.85 acres of this is contained in indemnity patents under act of March 2, 1855.
c 2,309.07 acres of this is contained in indemnity patents under act of March 2, 1855.
d 4,880.20 acres of this is contained in indemnity patents under act of March 2, 1855.
e 321,565.23 acres of this is contained in indemnity patents under act of March 2, 1855.
f 2,948.17 acres of this is contained in indemnity patents under act of March 2, 1855.
g 18,983.93 acres of this is contained in indemnity patents under act of March 2, 1855.
h 74,517.95 acres of this is contained in indemnity patents under act of March 2, 1855.
i 105,047.99 acres of this is contained in indemnity patents under act of March 2, 1855.

REPORT OF THE COMMISSIONER OF PATENTS.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., September 11, 1890.

SIR: I have the honor to submit the following report of the business of this office during the fiscal year ending June 30, 1890.

The following statement, prepared in the usual condensed form, exhibits the transactions in the office during the period specified, and compares them in important particulars with the corresponding transactions during four previous years. It also shows the balance now in the Treasury of the United States on account of the patent fund:

APPLICATIONS AND CAVEATS RECEIVED.

Applications for letters patent.....	40,201
Applications for design patents.....	1,093
Applications for reissue patents.....	121
Applications for registration of trade-marks.....	1,617
Applications for registration of labels.....	898
Caveats.....	2,330
Total.....	46,140

PATENTS GRANTED AND TRADE-MARKS AND LABELS REGISTERED.

Letters patent granted, including reissues and designs.....	25,857
Trade-marks registered.....	1,332
Labels registered.....	304
Total.....	27,493

PATENTS WITHHELD AND PATENTS EXPIRED.

Letters patent withheld for non-payment of final fee.....	3,403
Letters patent expired.....	11,885

RECEIPTS AND EXPENDITURES.

Receipts from all sources.....	\$1,347,203.21
Expenditures (including printing and binding, stationery, and contingent expenses).....	1,081,173.56
Surplus.....	266,029.65

COMPARATIVE STATEMENT.

	Receipts.	Expenditures.
June 30, 1886.....	\$1,200,167.80	\$991,829.41
June 30, 1887.....	1,150,016.05	981,644.09
June 30, 1888.....	1,192,094.83	958,739.14
June 30, 1889.....	1,180,567.22	993,697.24
June 30, 1890.....	1,347,203.21	1,081,173.56

INCREASE IN THE NUMBER OF APPLICATIONS FOR PATENTS, INCLUDING REISSUES, DESIGNS, TRADE MARKS, AND LABELS.

June 30, 1886.....	38,678
June 30, 1887.....	38,408
June 30, 1888.....	37,719
June 30, 1889.....	39,702
June 30, 1890.....	43,510

NUMBER OF APPLICATIONS AWAITING ACTION ON THE PART OF THE OFFICE.

July 1, 1886	6,772
July 1, 1887	7,601
July 1, 1888	7,227
July 1, 1889	7,073
July 1, 1890	6,585

BALANCE IN THE TREASURY OF THE UNITED STATES ON ACCOUNT OF THE PATENT FUND.

June 30, 1889	\$3,524,526.63
June 30, 1890	266,029.65
Total	3,790,556.28

From the foregoing it will be seen that the total number of applications received, including designs, reissues, etc., was 46,140; that the number of patents, etc., granted was 27,493; that the total receipts were \$1,347,203.21; that the total expenditures were \$1,081,173.56, leaving a surplus of \$266,029.65 to be turned into the Treasury of the United States to the credit of the patent fund, and making a total balance in the Treasury on account of the patent fund of \$3,790,556.28.

CONDITION OF BUSINESS.

It is not without some satisfaction that I direct attention to the fact that, despite the great increase in the number of applications, the number on hand in condition for action at the end of the last fiscal year was less than at the corresponding period in either of the four previous years. At the end of that year, too, the examinations of applications for patents in twenty-five of the examining divisions had been brought up to within two months of date, and all the remaining divisions were less than three months in arrears. In my last report I expressed the belief that arrears in all of the examining divisions would be practically done away with at an early date. The very heavy increase in the amount of business, to which attention has been directed, is, in my opinion, the only reason why that belief has not been wholly vindicated. Nevertheless, substantial progress has been made and the work of the office is more nearly up to date than it has been in many years. This result is due not to any increase in the number of employes or to any additional facilities whatever, but is to be ascribed to the unflagging industry and well-directed skill of the entire force under my control.

ACCOUNTING TO THE TREASURY.

During the last fiscal year a better system of accounting to the Treasury Department has been adopted with the approval of the honorable Secretary. Under the present practice a full statement of moneys received from every source is furnished to the Treasury Department at the end of each month. When this statement is received, two officers are deputed, one by the Fifth Auditor of the Treasury and the other by the First Comptroller, who carefully examine the accounts in the Patent Office, and having ascertained that the report is correct so certify upon its face. In addition, a quarterly account current is rendered to the Treasury Department. This system has worked well, and is believed to be an important improvement in the method of transacting the business in the office.

PHOTOLITHOGRAPHIC WORK.

The photolithographic work of the Patent Office has been done for many years by Mr. Norris Peters, whose death during the last year is deeply lamented. After his death, which occurred July 15, 1889, the business was carried on by his administrator in fulfillment of the contract made with Mr. Peters covering the fiscal year. I do not think it inappropriate in this connection to refer to the fact that during the many years Mr. Peters did the photolithographic work for the Patent Office he was as solicitous to maintain a high standard of excellence as were the officers of this bureau. The photolithographic drawings of the Official Gazette and of other publications of the Patent Office, unsurpassed in excellence, constitute a monument to his memory.

ADDITIONAL FORCE.

The present force of the Patent Office is inadequate. I have no reason to believe that the great increase in the amount of work done during the past year has been accompanied by any deterioration in its quality. On the contrary, I believe that such is not the fact. At the same time it must be admitted that the pace kept up in the Patent Office now, as during all recent years, is inconsistent with that high degree of care in conducting examinations which the patent system calls for. The Government undertakes on behalf of the inventor not only to give him a patent if his improvement is new and useful, but to conduct a painstaking examination in order to ascertain what the fact is in that regard. The fees paid by the inventors for that purpose are ample, as is abundantly proved by the surplus over and above all expenses, which, increasing yearly, is paid into the Treasury by this Office under the present system. There can be no excuse, excepting inadequacy of force, for failure to make the examinations thorough and exhaustive, and inadequacy of force, though it may excuse the Patent Office, is no excuse for the Government. The search for anticipating devices and processes should continue until a moral certainty is reached that further search would be unavailing.

A patent should evidence such painstaking care in examination that upon its face it should warrant a preliminary injunction, and there can be little doubt that the permanence of the American "examination system" depends upon so conducting the examinations into the novelty of alleged inventions as to make the seal of the Patent Office create a powerful if not a conclusive presumption that the patent is valid. I am aware that after the most exhaustive examination there still will remain a margin of possibility that the result of the examination is not to be relied upon. No examiner can possibly be aware of all that has been done which has not found a place in patents or in printed publications; but in this age of printing and publicity there is no reason why an examination sufficiently painstaking and exhaustive should not afford a practical guaranty that the patented thing was original with the patentee. Because, then, of the large increase in the number of applications for patents, and because of the necessity of more deliberate and exhaustive examination, and because of the fact that American inventors are already paying the necessary expenses, I recommend a substantial increase in the examining corps of the Patent Office. Of course such an increase would necessitate a corresponding increase in the clerical and laboring force of the bureau. There are now thirty examining

divisions. They should be increased to thirty-two, at least, and the additional force of examiners should include two principal examiners and at least fifteen assistant examiners of various grades.

ADDITIONAL ROOM.

I beg to refer to what I said upon this subject in my last annual report to the honorable Secretary. The same situation continues to exist, excepting that the imperative need of a larger force increases the necessity for additional room.

COMPENSATION OF EXAMINERS.

The salary of the Principal Examiners is \$2,500. This salary was fixed by Congress in 1848. It has never been increased. For a number of years past only \$2,400 has been appropriated. I am pleased to report that the appropriation for the current year covers the full sum provided by the statute; but a salary which was just in 1848 is not just in 1890. Aside from the fact that all salaries have been increased, on account of the increased cost of living, the present examiners of the Patent Office do far more and better work than was done by their predecessors forty years ago. Owing to the wonderful progress in every art, they are required to be much more learned. They are now experts of the highest order; they have legal ability and executive capacity. And what is true of the Principal Examiners is true in a proportionate degree of the Assistant Examiners, whose salaries ought also to be augmented. The Patent Office can not expect to maintain an examining corps of the highest order of ability unless the salaries are made commensurate with services rendered, and no one who has ever considered the subject has ever maintained that salaries established forty years ago are now just or reasonable.

LEGISLATION.

It is proper that I should call attention to needed legislation. Additional legislation affecting this Bureau is needed in two directions. The internal machinery of administration should be somewhat altered, and the statutes regulating the granting and terms of patents need amendment.

Examiners-in-chief.

The Board of Examiners-in-Chief, consisting of three members, was created by act of Congress, approved March 2, 1861. One purpose assigned by the statute creating the Board was "for the purpose of securing greater uniformity of action in the grant and refusal of letters patent." The Examiners-in-Chief have jurisdiction over appeals from the decisions of the Primary Examiners and the Examiner of Interferences. From all decisions of the Examiners-in-Chief further appeal lies to the Commissioner. I am satisfied that this latter appeal should be done away with. The term of office of the Examiners-in-Chief is permanent, and the highest appellate tribunal of the office should, like other judicial bodies, possess a permanent tenure. Another reason is found in the fact that with the growth of the business in the Patent Office it has become impossible for the Commissioner to discharge properly his appellate judicial powers as now devolved upon him by law.

The number of written decisions rendered by the Commissioner and Assistant Commissioner in appellate proceedings during the last fiscal year was eight hundred and twenty-five. Those decisions were made in two classes of cases—appeals directly from the decisions of the Principal Examiners, including the Examiner of Interferences, and appeals from the decisions of the Board of Examiners-in-Chief. The first class of cases relates to administrative functions, and may be called “executive appeals.” The second class presents questions for decision essentially judicial in their character, and may be called “judicial appeals.” Of the eight hundred and twenty-five decisions referred to about two hundred were rendered in cases that came up on appeal from the Examiners-in-Chief. Some of these cases presented important questions involving the patentability of inventions, and others involved the determination between rival claimants of the question which was the original first inventor. I am satisfied that no appeals should come to the Commissioner from the Examiners-in-Chief, and that his judicial jurisdiction over that body should go no farther than to grant new trials and rehearings in proper cases, according to the principles regulating such proceedings. I therefore recommend that proper steps be taken to secure an amendment to the law, having the effect to cut off all appeals from the Board of Examiners-in-Chief to the Commissioner, and at the same time affording the Commissioner the power to grant new trials or rehearings.

The appeal which now lies in *ex parte* cases from the Commissioner to the supreme court of the District of Columbia should be made to lie direct from the Board of Examiners-in-Chief to that court. Such a change in the organization of the Patent Office would relieve the Commissioner of a portion of that burden which is now too great to be properly discharged. It would save litigants the expense, annoyance, and delay of two appeals, where one should be sufficient, and it would secure that uniformity in decisions which the original act creating the board contemplated. The members of the board should receive the same compensation as the judges of the United States district courts, and be required to possess the same qualifications for the discharge of judicial duty. I think, too, they should be five in number.

Limitation of patents.

It is provided by section 4887 of the Revised Statutes that every patent granted for an invention that has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term. It is believed that this section was intended to prevent foreign applicants from obtaining patents in the United States of longer duration than the home patents previously taken out by them. Owing, however, to the unfortunate language employed in the statute, the courts have not been able to limit its construction to its intended scope and purpose. Its practical effect at the present time is to impose a penalty upon American inventors who patent their inventions abroad before their domestic patents are granted. There can be no sound reason for thus discriminating against the American inventors who patents his invention abroad. All persons competent to judge in the matter agree in the conclusion that section 4887 of the Revised Statutes should be modified so as to prevent a foreign patent previously obtained from affecting the duration of the American grant to the same inventor for the same invention.

It should be added that by no method can the Patent Office always satisfy itself whether a foreign patent has been obtained or not. An application, for instance, may be pending in the British patent office six months and may become a patent two days in advance of the date of the American grant to the same inventor for the same invention. In such a case the American patent should, according to the provisions of the statute referred to, expire at the end of fourteen years from the date of the foreign application, that being the date on which the foreign patent would expire. But this Office can have no legal evidence that such a patent has been granted, nor can it ordinarily obtain any information, hearsay or otherwise, upon the subject. Indeed, the foreign patent may be granted after the American patent has been printed and before its signature, and even in that case the American grant is limited by the duration of the foreign term.

Again, the change proposed should be made, in order that the American inventors may have the benefit of the provisions of the International Union for the Protection of Industrial Property, of which union the United States is a member. By the terms of that union persons who have made application for patents in one of the States constituting the union may within a definite period apply for a patent upon the same invention in the other countries belonging to the union without being prejudiced by intermediate acts, such as the publication or use of the patented article. The period now fixed for that purpose is six months, an additional month being allowed to countries beyond the sea, thus giving the citizens of the United States seven months from the filing date of their domestic applications within which to apply abroad without the loss of any rights existing at the date of the American application; but it is by no means an unusual thing for the American application to be much more than seven months in maturing into a patent. In a great many cases interference proceedings arise with other applications or prior patents. Sometimes several parties are involved in a contest for priority and a complicated trial results, extending over an unfortunately long period of time. In all such cases the American inventor must be deprived of the benefits designed to result from the Union for the Protection of Industrial Property, or he must apply for a foreign patent within the treaty period of seven months. In case he elects to accept the latter alternative, his foreign application is likely to mature into a patent before the obstacles to the granting of the American patent are removed, in which case section 4887 applies and limits the duration of the American patent, besides making it almost impossible to tell when the shortened term will expire.

Interstate trade-marks.

According to the present law only such trade-marks as are used in connection with foreign commerce or with commerce with the Indian tribes are registered in the Patent Office. It is believed that there is no sound reason for leaving trade-marks used in interstate commerce unprotected by registration. This question is presented in a new aspect by the adhesion of the United States to the Union for the protection of Industrial Property. Article VI of the convention acceded to provides:

Every trade or commercial mark regularly deposited in the country of origin shall be admitted to deposit and so protected in all the other countries of the Union.

Additional legislation would seem to be required to enable citizens of the United States to lay a basis for registration abroad by first effect-

ing domestic registration when these trade-marks are used in commerce among the States, and also to enable aliens to secure by appropriate Congressional action the benefit of the treaty stipulations.

Payment of patent fees.

Section 4885 of the Revised Statutes provides that every patent shall bear date as of a day not later than six months from the time at which it was passed and allowed and notice thereof was sent to the applicant or his agent, and that if the final fee is not paid within that period the patent shall be withheld. Section 4935 provides that patent fees may be paid to the Commissioner of Patents, or to the Treasurer, or any of the assistant treasurers of the United States, or to any of the designated depositaries, national banks, or receivers of public money designated by the Secretary of the Treasury. No method is provided by law for enabling the Patent Office to know that payment has been made to any of the officers designated in the latter section of the statute. The practice at present is for the officer receiving money for patent fees to deliver a certificate of deposit to the depositor, to be by him furnished to the Patent Office. It results in many cases that the fee is paid within the six months provided for by section 4885, while the Office remains in ignorance of the payment until after the expiration of that period. Of course the patent can not bear date within six months from the time of its allowance. Hence the Office resorts to the practice of re-allowing the application, in order to comply with the terms of the statute. Clearly the law should be amended so as to require the officer receiving the money to forward the certificate of deposit, or a duplicate thereof, to the Commissioner of Patents, and this certificate should not only state what sum was paid, but also on account of what application or service the payment was made. Perhaps the same object could be secured by a Treasury regulation. Either by an amendment to the law or by the method last suggested a remedy should certainly be found for the evil pointed out.

Charge for certified copies of printed matter.

My attention has frequently been called to the hardship which the present law imposes in its charge for certified copies of printed matter. Section 4934 of the Revised Statutes provides that for a certified printed copy of a patent a charge of 10 cents per hundred words shall be made. The price of the same printed patent if uncertified is 25 cents per copy. The charge for the official certificate to any paper is 25 cents, and it would seem but just that the Commissioner should be authorized to furnish printed copies of patents at the present rate with the additional charge of the certificate. I would respectfully suggest that the law might be amended to read as follows:

For certified copies of patents and other papers, when written copies are required, ten cents per hundred words; but when certified printed copies of patents are required, twenty-five cents for the printed copy and twenty-five cents for the certificate thereof.

SALARY OF COPYISTS.

In this Bureau there are seventy-six copyists, receiving the salary of \$720 per annum. If I am correctly informed, in all other bureaus of the Department of the Interior the lowest salary paid to copyists is \$900 per year, and I recommend that steps be taken to secure the same

salary for the seventy-six copyists referred to. As the matter now stands, there is a disposition on the part of copyists receiving the salary of \$720 per annum to seek a transfer to other bureaus, in which for the same services they will receive \$900. This discrimination against the Patent Office is both unwise and, I think, unintended, and has the effect to cause the loss from time to time of trained employés, who would prefer to remain in the Patent Office if they could receive the salary paid elsewhere in the same Department.

Very respectfully, your obedient servant,

C. E. MITCHELL,
Commissioner.

The SECRETARY OF THE INTERIOR.

REPORT OF THE COMMISSIONER OF PENSIONS.

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
Washington, D. C., October 4, 1890.

SIR: I have the honor to submit the following statement of the business of this Bureau for the fiscal year ended June 30, 1890, also information to September 30, 1890, concerning the operations of the office for the enforcement of the pension act of June 27, 1890, and the act increasing the clerical force of the Bureau and the arrangements for the enforcement of said Pension act. I also submit herewith certain tables setting forth fully the business of the office.

There were on June 30, 1890, 537,944 pensioners borne upon the rolls, and classified as follows:

Army invalid pensioners.....	392,809
Army widows, minor children and dependent relatives.....	104,456
Navy invalid pensioners.....	5,274
Navy widows, minor children and dependent relatives.....	2,460
Survivors of the war of 1812.....	413
Widows of soldiers of the war of 1812.....	8,610
Survivors of the Mexican war.....	17,158
Widows of soldiers of the Mexican war.....	6,764
Total.....	537,944

There were 66,637 original claims allowed during the year, being 14,716 more original claims than were allowed during the fiscal year 1889, and 6,385 more than were allowed during the fiscal year 1888.

The amount of the first payments in these 66,637 original cases amounted to \$32,478,811.18, being \$11,036,492.05 more than the first payments on the original claims allowed during the fiscal year 1889, and \$10,179,225.72 more than the first payments on the original claims allowed during the fiscal year 1888.

The average value of the first payments on these original claims for 1890 was \$185.71.

The average annual value of each pension at the close of the fiscal year was \$133.94.

At the close of the fiscal year there remained in the hands of pension agents the sum of \$580,283.87 of the pension fund which had not been disbursed for want of time, and which has been returned to the Treasury; and there were 20,638 pensioners unpaid at the close of the fiscal year who were entitled to receive \$4,357,347.30, which has since been paid from the appropriation for pensions for the fiscal year 1891.

These facts are fully set forth in table No. 5.

The total amount disbursed on account of pensions, expenses, etc., was \$106,493,890.12.

CHANGES IN THE ADMINISTRATION OF THE OFFICE.

Upon taking charge of the Bureau of Pensions in October, 1889, I examined into the organization of the office and the methods of transacting the business. I soon decided that a number of important changes were necessary to secure satisfactory results; and although I brought these matters to your attention at the time I think it proper to make a record of them in this report. I found—

(1) That there was no satisfactory specified duties provided for the Deputy Commissioners or the Chief Clerk, either by law or by regulations.

(2) That several thousand letters were daily received from claimants and their attorneys, making complaints of delay and inquiries as to the condition of pension claims, to which no acknowledgment or reply was made.

(3) That the accounts of the Bureau were assigned to three different divisions.

(4) That the Medical Division was divided into sections for the consideration of certain classified diseases.

(5) That the power of re-opening claims was exercised by heads of divisions and examiners without submitting the cases to the Commissioner or Deputy Commissioners.

(6) That claims were drawn from the files, from day to day, for adjudication at the discretion of the file clerks, claimants having no power to cause the settlement of their claims when complete.

(7) That about 18 per cent. of the official force was assigned to duty in the field for the special examination of cases, and that there were 14,335 cases in the Special Examination Division.

(8) That a division had been created called the Board of Re-review, composed of about forty persons, for the re-examination of cases passed upon by the Board of Review.

(9) That matters relating to the appointment and promotion of the official force of the Pension Office and of Boards of Medical Examiners were under the direction of two divisions.

For the purpose of effecting, what I conceived to be necessary changes in the administration of the affairs of the Bureau, I issued the following orders:

DEPARTMENT OF THE INTERIOR, BUREAU OF PENSIONS,
Washington, D. C., November 4, 1889.

Order No. 145.]

For the convenient transaction of the business of the Bureau the following assignment of duties is made:

(1) The First Deputy Commissioner will supervise the business arising in the following-named divisions: Eastern Division, Southern Division, and Army and Navy Survivors' Division.

(2) The Second Deputy Commissioner will supervise the business arising in the following-named divisions: Middle Division, Western Division, and Old War and Navy Division.

(3) All cases involving intricate questions of law or fact will be brought to the personal attention of the Commissioner for his action by the proper Deputy Commissioner.

(4) All claims involving a large first payment, and all claims involving monthly payments of more than \$12, shall be brought to the personal attention of the Commissioner, by the proper Deputy Commissioner, in conjunction with the proper heads of divisions.

(5) The Chief Clerk will have the supervision of the following-named divisions: Record Division, Stationery and Accounts Division, Mail Division; also the force of messengers, laborers, etc.

The Chief Clerk will also have the general supervision of the business of the Bureau and take care that proper discipline is maintained and that the business is conducted in an orderly and business-like manner, reporting immediately to the Commissioner any neglect, misconduct, or inefficiency of the clerical force.

He will see that a proper and prompt acknowledgment is made of all letters and documents received.

He will also see that claims are taken from the files for consideration in their proper order as to precedence.

He will see that the Pension Bureau building and grounds are put in perfect order and so kept, and to this end he will carefully inspect the force of messengers, laborers, and messenger boys as to their fitness for the work required of them.

(6) The following-named divisions will be under the immediate supervision of the Commissioner: Medical Division, Law Division, Board of Review, Board of Review, Special Examination Division, Certificate Division, and Finance Division.

(7) The pending claims now on file in this Bureau constitute so great a mass that it is a physical impossibility to give them all immediate consideration.

I am anxious that the Bureau shall meet the just expectations of claimants and the public in the amount of business transacted and the manner in which the duties are performed. To this end I enjoin upon the entire official force—those on duty here in Washington, those assigned to duty as special examiners, and the boards of medical examiners—promptness, diligence, and fidelity in the performance of every duty.

Recommendations for promotion will be made upon merit. The inefficient will be recommended for retirement.

GREEN B. RAUM,
Commissioner.

An order was also issued conferring upon the Finance Division the authority to adjust all the accounts of the Bureau.

I gave verbal directions to the Medical Referee on November 15 for the re-organization of the Medical Division, with a view to having the examiners and reviewers consider all classes of cases as they were presented to them.

On November 25, 1889, I issued the following order:

WASHINGTON, D. C., November 25, 1889.

Order No. 143.]

(1) Great care must be exercised in the rejection of applications for pension. No case should be rejected until every available source of information has been examined, unless the rejection be clearly upon legal points.

All letters rejecting claims shall be brought to the desk of the Commissioner for signature.

(2) No rejected claims will be re-opened, except upon new and material evidence going to the cause of rejection.

The Deputy Commissioners will have jurisdiction to re-open claims in the divisions respectively assigned to their charge.

In all cases where evidence is filed for the re-opening of cases, the heads of adjudicating divisions will, at the proper time, cause to be prepared a brief statement of the facts on slips for the action of the Deputy Commissioner, who shall note his action thereon, whereupon the claimant shall be immediately informed by letter of the action of the Office.

GREEN B. RAUM,
Commissioner.

The following orders were issued to change the system of drawing cases from the files and for establishing the system of "Completed Files:":

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
Washington, D. C., December 23, 1889.

Order No. 149.]

The files of pending claims in each division shall at once be examined, counted, and proper account taken of the same.

Where a claim, upon inspection of the jacket and testimony strapped to the case, seems to be complete, a proper record shall be made of the claim on a card prepared

for that purpose, and the case shall be kept upon a list known as the "Completed Files," and these cases shall be considered in the order of the filing of the last piece of evidence.

Upon examination of these cases, if it is found that another call for evidence is required, such call shall be made, and the case returned to the files of pending cases to await the reply to the call. When the evidence in response to that call is furnished, the claim shall at once be restored to the list of "Completed Files" and the claimant notified.

Placing a claim on the list of "Completed Files" shall not be considered as a favorable adjudication of the claim. This arrangement is intended simply to secure the consideration of the claims which are apparently completed, at the earliest possible date. The "Completed Files" shall also be arranged so as to separate the original cases from the increase cases.

Hereafter all calls for evidence shall be made upon blanks which shall indicate by number the nature of the call, and a record of such call shall be made upon a card, opposite the number on the card corresponding with the number of the call in the blank.

Claimants and their attorneys are urgently requested to prepare their evidence in response to these calls according to the number, and to indorse on the back of the evidence "Reply to call No. —, —, 18—."

These "calls for evidence" cards shall be strapped to the case, and as the evidence in reply to the call is received the file clerk shall immediately record the date of the receipt of the evidence at the proper number of the call, and this new evidence shall be strapped to the case.

When the last evidence called for is received and a record thereof made on the card, the case shall at once be entered on the list of "Completed Files" in its proper order and the claimant notified.

All answers to applications for status of cases on the list of "Completed Files" shall be upon a blank informing the applicant that the case is pending in the "Completed Files."

Hereafter the order of procedure in original cases shall be as follows:

(1) The Mail Division shall deliver all applications for pension to the Record Division on the day received.

(2) The Record Division shall promptly make a record of the case, give it a number, and acknowledge the receipt of it, and refer it to the proper division.

(3) A call shall be made upon the Secretary of War for a report of the military service and hospital record of the claimant.

(4) An order for the medical examination of the claimant shall be made, and a call shall be made upon the claimant for such evidence as seems necessary to complete the case upon blanks which shall habitually use the same number for the same call. A proper record card shall be made for the case and the case put upon the files of pending claims. When the last piece of evidence called for has been received and a record made of the same upon the card, the case shall be placed upon the list of "Completed Files" to be considered in its order.

Chiefs of divisions shall require examiners to devote their entire time during five days of the week to the consideration of cases borne upon the list of "Completed Files."

On Saturday of each week the entire force of examiners shall devote themselves to the examination of cases borne upon the pending files and in the preparation of the necessary calls for evidence in those cases. On Friday afternoon of each week the file clerks shall withdraw from the pending files fifteen cases for each examiner, and have them placed upon the desks of the examiners before 4 o'clock on Friday afternoon.

GREEN B. RAUM,
Commissioner.

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
Washington, D. C., January 6, 1890.

Order No. 151.]

Claimants are hereby authorized to apply to the Commissioner of Pensions to have their claims placed upon the list of "Completed Files" for immediate consideration.

Such applications may be made by the claimants or their attorneys of record, and shall set forth:

(1) That the declaration has been made in due form, stating the proper service of the soldier and the facts as to incurrence of his disability in, and his discharge from, the service.

(2) That the proof establishes that the disability alleged in the declaration was incurred in the service and line of duty.

(3) That the proof connects the present disability for which pension is claimed with wounds or diseases incurred in the service, and establishes the fact of disability during any past pensionable period.

(4) That the claimant has, with the authority of the Bureau of Pensions, had a regular medical examination in respect to the disability described and claimed for in the declaration.

(5) That, in the opinion of the claimant, the claim is fully made out and complete.

In the claims of widows it must be alleged that proof has been made showing that the soldier died of an injury or disease contracted in the service, and that claimant is the soldier's widow.

In the case of dependent relatives it must be stated that the proper proof of dependence has been filed in the claim and that the soldier left no widow or minor children.

If the application is made by the attorney of record, in addition to the other statements required he shall certify upon honor that, after a careful consideration of the case, he is of the opinion that the case is complete.

Claims placed upon the list of "Completed Files" under this order will be considered in the order of the date they are so placed.

This order does not apply to rejected cases.

GREEN B. RAUM,
Commissioner.

About forty persons were recalled from duty in the field as special examiners and assigned to duty in the adjudicating divisions of the Bureau.

On December 21, 1889, an order was issued abolishing the Board of Re-review and distributing the force employed there amongst other divisions.

On November 22, 1889, an order was issued creating an Appointment Division in the Pension Office, which division has charge of the appointments and promotions of the official force of the office and also of the establishment of the different medical boards throughout the country.

These orders have had the effect of putting the office upon a thorough business basis. The Deputy Commissioners and Chief Clerk have assigned to them important and well-defined duties. Letters of inquiry from claimants are acknowledged on the day of their receipt. All accounts of the Bureau are adjusted by the Finance Division. The Medical Division has been reorganized. Rejected claims are now reopened upon the order of a Deputy Commissioner. And all claims carrying a large first payment receive the consideration of a Deputy Commissioner and the Commissioner before final allowance.

THE "COMPLETED FILES."

The "Completed Files," or trial docket, I regard as of great importance in securing the prompt adjudication of completed cases upon the motion of the claimant or his attorney.

Prior to the establishment of this system, the complaint was almost universal that thousands of claims were pending in the Office, the consideration of which had been neglected for years, and that the claimants were powerless to secure their consideration. A soldier had a right to file an application for a pension and to present all the evidence necessary to prove his claim, but he had no power to bring that claim before an adjudicating division by any action on his part, the drawing of his claim from the files for that purpose being in the discretion of a file clerk.

Under the system of the "Completed Files" the claimant has a right, upon a proper certification that his claim is complete, to have it immediately placed upon the "Completed Files" and taken up in its order for adjudication. Claims placed upon the "Completed Files" are taken up

within a week for action, and if found complete are immediately allowed. If proofs are lacking a call is immediately made upon the claimant to supply the deficiency, and upon the receipt of the required evidence the claim is again taken up for consideration. The soldier who is entitled to a pension and promptly furnishes the required evidence to establish his claim should have his case disposed of without delay. He should have the right to notify the office that he is ready for trial, and not be compelled to await the action of a file clerk in drawing his claim; for however diligent the file clerks may be, it is impossible for them, when there are a million claims pending, as is now the case, to have such knowledge of their condition as to enable them daily to select the cases which should have precedence in adjudication because of their priority of completion.

The "Completed Files" system is an orderly method of procedure. It gives the claimant the right, upon completing his case, to give notice and have it adjudicated.

To June 30, 99,761 claims had been placed upon the "Completed Files" upon requests made on behalf of claimants.

This system has had the effect of enabling many thousand claimants whose claims have been pending from five to twenty years to bring their claims to the attention of the Bureau for adjudication and allowance.

From December 1, 1889, to June 30, 1890, there were allowed and paid 5,273 claims with first payments of \$1,000 and upwards.

The complaint of delay has been reduced to a minimum. This system throws the responsibility upon the claimant and his attorney of having the claim adjudicated, and has proved to be more satisfactory than the old system of leaving the selection of claims for adjudication to the discretion of the file clerks.

As a result of these changes in the business methods of the Office, more work has been accomplished in a given time than was ever performed before. On the 21st of October, 1889, when I took charge of the Office, the work of adjudicating claims and issuing certificates had, during the period from July 1, 1889, fallen far behind the same period for the previous fiscal year; while from October 20, 1889, to June 30, 1890, there was an increase in the adjudication of claims and the issuing of certificates greatly in excess of the same period of the preceding fiscal year. This will be clearly seen from the following figures:

Total number of certificates issued from July 1 to October 19, 1888.....	46,991
Total number of certificates issued from July 1 to October 19, 1889.....	30,664
Falling off in the issues for the period in 1889.....	16,664
Total number of certificates issued from October 20, 1889, to June 30, 1890..	121,415
Total number of certificates issued from October 20, 1888, to June 30, 1889..	98,332
Increase in the work for 1890.....	23,080
Total number of certificates issued, year ending June 30, 1890.....	151,456
Total number of certificates issued, year ending June 30, 1889.....	145,292
Total number of certificates issued, year ending June 30, 1888.....	113,681
Increase in 1890 over 1889.....	6,366
Increase in 1890 over 1888.....	38,577
Total of original certificates issued, year ending June 30, 1890.....	66,637
Total of original certificates issued, year ending June 30, 1889.....	51,896
Increase in 1890 over 1889.....	14,741

This great amount of work was accomplished by distributing the clerks who composed the Board of Re-review amongst other divisions and calling in forty special examiners from the field, thus adding eighty persons to the force engaged in the adjudication of claims; and particularly by concentrating the work of the Office for five days in the week, upon the adjudication of claims as provided for in Order No. 149, creating the system of "Completed Files."

SPECIAL EXAMINATION OF CLAIMS.

The number of claims which had been ordered for special examination was so great that it seemed to me important to make a special effort to have the work of that division brought into reasonable bounds. I urged upon the examiners great diligence in the performance of their duties, and in June last I detailed 116 persons as an additional force for this work, making in all 333 on duty in the field. I am glad to be able to report as a result of these efforts that the number of cases now in the hands of the Special Examination Division has been reduced from 14,225 to 7,824; of these only about 5,000 are in the hands of special examiners, the others being *in transitu* to and from the Office.

IN RELATION TO ACT OF APRIL 4, 1890.

The act of Congress approved April 4, 1890, providing for a deficiency of \$21,598,834 for the payment of pensions during the fiscal year ending June 30, 1890, directed that, as far as practicable, the Commissioner of Pensions should, in his annual report, state the amount paid for pensions during the fiscal year for which the report was made in such a manner as will show separately the number of pensioners, and the aggregate payments for pensions on account of each of the wars for which pensions have been authorized, and on account of military and naval services since the close of the late war.

After a very careful consideration of the vast amount of work necessarily incident to the preparation of the statistical information called for in this law, and of the amount of other work which was necessary to be done in order to keep up the adjudication of the pension claims in the Office, I reached the conclusion that it was not practicable to furnish the information called for in said act, for the reason that such information could be given only after an examination of each of the 775,310 cases upon the admitted files of this Bureau.

OPERATIONS OF THE LAW DIVISION.

During the fiscal year ending June 30, 1890, there were received—

Motions for reconsideration of former departmental decisions	676
Appeals on questions of title	3,901
Total appeals received	4,577
Reports to the Secretary on pending appeals	2,913
Cases in which the action of the Commissioner was affirmed by the Secretary ..	827
Cases in which the action of the Commissioner was reversed by the Secretary ..	194
Cases in which former departmental decisions were reversed by the Secretary on motion for reconsideration	47
Appeals now pending awaiting report	1,661
Money recovered by refundment (illegally obtained) and covered into the Treasury	\$14,017.57
Money recovered (where illegally withheld) and turned over to pensioner	78.00
Total amount recovered	14,095.57

TOTAL OFFICIAL FORCE.

The official force of the Bureau of Pensions—

Now authorized by law.....	2,009
There are 1st Pension Agents and 419 persons employed at said Agencies, in all.....	437
There are 1,028 Boards of Medical Examiners, of three persons each, and 323 single Surgeon Examiners, in all.....	3,467

Total number of persons employed in connection with the Bureau of Pensions.....	5,913
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STATEMENT OF MAILS RECEIVED AND SENT FOR THREE MONTHS.

That the public may have a proper understanding of the immense amount of business that is now being transacted in this Bureau, I lay before you the following statement of mail matter received and sent out during the months of July, August, and September, just passed :

Amount of mail received in—	
July, 1890.....	341,451
August, 1890.....	691,637
September, 1890.....	333,621
Total.....	1,276,729
Amount of mail sent out in—	
July, 1890.....	226,076
August, 1890.....	181,325
September, 1890.....	182,961
Total.....	485,462

THANKS TO THE OFFICIAL FORCE.

I take pleasure in stating that I have found the official force of the Office prompt and diligent in the performance of every duty, and I extend to them my sincere thanks for the large amount of work that has been accomplished during the few months that I have been connected with the Office.

DIFFERENCE BETWEEN THE ACTS OF MARCH 3, 1883, AND MARCH 4, 1890.

I respectfully invite your attention to the great difference in amount between the rate of \$30 per month granted by the act of March 3, 1883, to pensioners who are so disabled as to be incapacitated for performing any manual labor, and the rate of \$72 per month granted by the act of March 4, 1890, to pensioners who require the regular aid and attendance of another person. There are many claimants who are entirely incapacitated for performing manual labor and who periodically require the aid and attendance of other persons, but who are unable to establish the fact of the requirement of constant aid and attendance.

It occurs to me that it would be a just provision to create a higher rate than \$30 per month for cases of this description, and I respectfully recommend that a rate of \$50 per month be created for them.

SURVIVORS OF THE WAR FOR THE UNION.

During the consideration of the various pension bills at the late session of Congress, the question as to the number of soldiers who are now survivors of the late war of the rebellion was carefully considered at the

request of the Committee on Invalid Pensions. The following is the result:

Upon a careful examination of the subject, I came to the conclusion that more than one-third of the men who were discharged in 1865, were subject, by reason of wounds and other disabilities, to a higher rate of mortality than ordinary citizens in private life. The rate of mortality of soldiers on the pension rolls has been far greater than the rate of death upon which the American tables are constructed. I fixed upon the number of 586,000 discharged from the army as constituting the number who were probably subject to this higher rate of mortality, and I came to the conclusion that the expectation of life with this body of men, by reason of their disabilities, had been shortened about twelve years.

Number of soldiers enlisted during the war for the Union, excluding re-enlistments	2,213,365	
Number killed in battle and by other casualties and who died of disease to July 1, 1865	364,116	
Estimated number of deaths of soldiers discharged during the War to July 1, 1865	25,284	
Number of desertions	121,896	511,296
Number of survivors of the War July 1, 1865, less deaths and desertions		1,702,069
Number of survivors July 1, 1865, less deaths and desertions, who were subject to the usual laws of mortality	1,116,069	
Number of survivors July 1, 1865, who because of wounds and other disabilities were subject to a higher rate of mortality equal to 12 years shortening of the expectation of life	586,000	
Number surviving July 1, 1890, who are probably subject to the ordinary life tables	831,089	
Number surviving July 1, 1890, who are subject to a greater death rate	415,000	
Total number of survivors July 1, 1890		1,246,089

Of the foregoing number of survivors about 144,000 are now 62 years of age and upwards.

ACT OF JUNE 27, 1890.

There have been received in the Pension Office 460,282 claims to September 30, 1890, under the disability pension act of June 27, 1890. About 50 per cent. of these claims have been filed by persons who already have claims on file in the office. It will be readily understood that the care of such an enormous number of claims received in so short a time necessarily taxed the resources of the Office to its fullest extent. The work of the Mail Division ran up to more than 32,000 pieces of mail per day, to be opened, classified, and properly disposed of. The work in the Record Division was correspondingly increased, and a very large additional force was detailed to assist in the work of examining, jacketing, and receipting for these new claims. At this writing (October 1) the division is handling 10,000 claims a day.

To secure the adjudication of these claims as promptly as possible, Congress has authorized the employment of an additional force of 438 medical examiners, clerks, and other employes. In addition to this force, I have just ordered 175 persons from the field where they have been employed in the special examination of cases. This will add 613 persons to the force employed in the Office on September 1.

I have arranged the work of the Office so that claims under the old laws shall be adjudicated as rapidly as they are completed without

interfering with the adjudication of completed claims under the new law. And if, upon the assembling of Congress in December, it is found that the present force is insufficient for the adjudication of these new claims as rapidly as they are completed, I will not hesitate to ask that you recommend to Congress an increase of the official force of the Pension Bureau, so as to secure the prompt settlement of these claims. It was obviously the intention of Congress in the passage of this act to afford speedy relief to thousands of disabled soldiers of the late war who have been unable to establish by proof that their present disabilities are the result of Army service. With the view of giving claimants the benefit of all proofs which may have been filed in claims made by them under other laws the following regulation has been approved by you:

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
Washington, D. C., September 26, 1890.

Order No. 162.]

For the purpose of securing the prompt adjudication of claims filed under the act of June 27, 1890, it is ordered as follows:

(1) That in all original invalid claims where the claimant, under the act of June 27, 1890, has a claim under previous laws granting pensions for service in the Army or Navy of the United States during the late War of the Rebellion, whether upon the pending or rejected files, the proofs in that claim shall be considered in connection with the new claim; and where the proofs in the old claim and a medical examination had within two years previous to the filing of the new claim, establish the facts of an honorable discharge after ninety days' service, and of the existence of a disability of a permanent character not the result of vicious habits, and which incapacitates the claimant from the performance of manual labor in such a degree as to render him unable to earn a support, the new claim shall be adjudicated upon the proofs on file. But in all cases where the new declaration claims for disabilities which are not set forth in the original claim a medical examination shall be ordered where the interests of the claimant seem to require it, or where such examination is requested by the claimant.

(2) That in all original widows' cases when the claimant, under the act of June 27, 1890, has a claim filed under previous laws, whether upon the pending or rejected files, the proof in that claim shall be considered in connection with the new application. The points necessary to establish are the following:

First. An honorable discharge of a soldier after ninety days' service.

Second. The death of the soldier.

Third. The marriage of the claimant with the deceased soldier prior to June 27, 1890.

Fourth. The names and dates of the births of any surviving children of the soldier under sixteen years of age.

Fifth. That the claimant has not remarried.

Sixth. That the claimant is without other means of support than her daily labor.

Upon consideration of the claim, if the evidence is found to be insufficient, a call will be made upon the claimant for all the evidence necessary to complete the claim. Claimants should supply such evidence as they may know to be wanting in advance of any call for the same.

(3) In claims under the act of June 27, 1890, where a claimant applies for a pension under said act for a disability of a permanent character, for which he is already pensioned at a rate less than \$12 per month, under the laws granting pensions to soldiers or sailors of the United States who served during the War of the Rebellion, and it shall appear from the proofs on file that he served for ninety days and was honorably discharged, a medical examination shall be ordered to determine to what degree his disabilities incapacitate the claimant from earning a support by manual labor, and the claim shall be adjudicated thereupon.

(4) In the claims filed under the act of June 27, 1890, where it appears that the claimant is a pensioner at a less rate than \$12 per month under previous laws granting pensions to soldiers or sailors of the United States who served during the war of the rebellion, the evidence filed in his admitted claim shall be considered in connection with his new claim, and if it shall appear from the declaration and proofs on file and a medical examination had within two years previous to the filing of the new claim, that the soldier is suffering from disabilities for which he is not pensioned, and that his disabilities are of a permanent character which incapacitate him from earn-

ing a support by manual labor, and are not the result of his own vicious habits, the claim shall be adjudicated upon the proofs on file unless a new medical examination shall be deemed necessary or is requested by the claimant.

(5) In claims filed under the act of June 27, 1890, where the claimant has not applied for a pension under any other act, the proof required to establish a claim will be:

First. Proof of service for ninety days or more in the military or naval service of the United States during the late war of the rebellion, and an honorable discharge therefrom.

Second. Proof that the claimant is suffering from a mental or a physical disability of a permanent character, not the result of his own vicious habits, which incapacitates him from the performance of manual labor in such a degree as to render him unable to earn a support.

Medical evidence and the sworn statements of neighbors will be considered upon the question of disability, but a medical examination will be required to determine the degree of disability of the claimant. An order for examination in such cases will be made as soon as the claim is reached in its order.

The facts of service and honorable discharge in all claims under the act of June 27, 1890, must be shown by reports from the records of the War Department, which will be called for by the Bureau of Pensions.

(6) The cases of dependent parents under the act of June 27, 1890, require proof that the soldier's death was due to his service without reference to the length of such service, that he left no widow or minor children, and that such parent or parents are without other present means of support than their own manual labor or the contributions of others not legally bound for their support.

(7) Claims filed under the act of June 27, 1890, shall be taken up for adjudication in their regular order, and all necessary action had, so that they shall be disposed of without delay.

GREEN B. RAUM,
Commissioner.

Approved:

JOHN W. NOBLE,
Secretary of the Interior.

It is believed that there are probably one hundred thousand claims in this Office which can be properly allowed under the provisions of these regulations.

The act of June 27, 1890, is the first disability pension law in the history of the world which grants to soldiers and sailors pensions for disabilities which are not proven to have been incurred in the service and in line of duty. This law recognizes a higher obligation of the people to their disabled veterans than was ever formulated into law before.

Nothing shall be left undone by this Bureau to give effect to this latest expression of the gratitude of the American people to the soldiers who saved the Republic.

GREEN B. RAUM,
Commissioner.

The SECRETARY OF THE INTERIOR.

SUMMARY OF TABLES.

Table No. 1 shows that there were at the close of the year 537,944 pensioners, classified as follows: 392,809 Army invalids; 104,456 Army widows, minor children, and dependent relatives; 5,274 Navy invalids; 2,460 Navy widows, minor children and dependent relatives; 413 survivors of the war of 1812; 8,610 widows of those who served in that war; 17,158 survivors of the war with Mexico, and 6,764 widows of those who served in said war.

There were added to the rolls during the year the names of 66,637 new pensioners, and the names of 1,901 whose pensions had been previously dropped were restored, making an aggregate of 68,538 pensioners added during the year.

During the same period the names of 20,319 pensioners were dropped for various causes, leaving a net increase to the rolls of 48,219 names.

The average annual value of each pension at the close of the year is shown to have been \$133.94. The aggregate annual value of pensions is \$72,052,143.49.

The amount paid for pensions during the year was \$105,528,180.38, an increase in amount over the previous year of \$17,253,067.10.

The total amount disbursed by the agents for all purposes was \$106,493,890.19.

Table No. 2 shows that during the year 20,319 pensioners were dropped from the rolls. The 7,752 widows, minor children, and dependent relatives, whose names have been dropped, are so classified as to show the number of widows with and those without minor children, the number of minor children who were pensioned in their own right, and the number of dependent mothers and fathers; and this table also shows the whole number of pensioners on the rolls with a like subdivision of the widows' class.

Table No. 3 exhibits the amount of appropriations and the balances available for the payment of pensions for the fiscal year, 1890.

Table No. 4 exhibits the amount paid out on account of pensions by each agent, under each item of appropriation, as shown by their accounts current. This table also shows a disbursement of \$16,220.63 for the payment of arrears of pensions in cases where the original pension was granted prior to January 25, 1879, and the date of commencement of pension was subsequent to discharge or death.

Table No. 5 is a new one this year. It is intended to supply information not heretofore furnished. It shows the number and amount of first payments made at the pension agencies during the year in each class of cases, as well as the number of cases in which first payments were due but not made, with the amounts thereof, in the hands of the agents, June 30, 1890.

This information has been furnished in original cases only, in Table No. 1 of former reports. It will be seen that 130,514 first payments were made during the year, amounting to \$38,721,866.03, and that 20,638 cases remained in the hands of the agents June 30, 1890, in which the first payments due amounted to \$4,357,347.30.

It will also be seen that \$2,056,700.45 were paid by the pension agents as fees to attorneys during the year.

Table No. 6 shows the amount paid for pensions each year since 1871 to the survivors and widows of the war of 1812, and since 1887 to the survivors and widows of the war with Mexico.

Table No. 7 shows the number of pensioners on the rolls of each agency by the several classes, and compares the aggregate number with that of the previous year, showing in each class the net increase or net decrease. It also shows the net increase to the rolls during the year, which, as before stated, was 48,219.

Table No. 8 shows the different monthly rates of pension paid to army and navy invalids, and to army and navy widows, minor children, and dependent relatives, together with the number of pensioners of these classes and of each of them.

Table No. 9 gives the location and geographical limit of each pension

agency, the name of each agent, and the balance of funds remaining to his official credit at the close of the year. These balances, except arrears, are immediately covered into the Treasury at the close of the fiscal year.

Table No. 10 shows the number of original pension claims filed each year since 1861, the number allowed, and the number of pensioners on the rolls at the close of each year. Since 1861 804,374 claims have been filed on account of disability, and 437,096 claims on account of death alleged to be due to causes originating in the service. The claims of the latter class have been filed by widows, minor children, and dependent relatives. Of the invalid claims 490,492 have been allowed; and of the widows, minors, and dependents, 278,004—a total of 768,496.

Since 1871, 79,789 claims for pension on account of service during the war of 1812, which pension was provided for by the acts of 1871 and 1878, have been filed. Of this number 34,917 have been filed by the surviving soldiers and sailors, and 44,872 by the widows of those who served in that war. Only 166 claims have been filed during the past fiscal year by survivors of that war, and 16 by widows.

It thus appears that in the aggregate 1,353,190 pension claims have been filed since 1861, and that in the same period 855,758 have been allowed. The number of pensioners on the rolls at the close of each year is stated. The amount disbursed on account of pensions since 1861 has been \$1,158,712,303.36.

Table No. 11 shows the number of army invalid claims allowed each year since 1861, classified and arranged so that in each year's allowance it is shown in what years the claims were filed. The whole number of invalid claims filed each year since 1861 is given, and it is shown what percentage of the number of claims filed each year has been allowed.

Table No. 12 shows the number of each class of claims on the files of the Bureau at the commencement of the year, the number filed during the year, and the number admitted and rejected during the same period. It also shows the number of each class pending, and on the rejected files at the close of the year. A statement is also given as to the number of bounty land claims filed, allowed, rejected, and remaining on file.

Table No. 13 is a comparative statement of the pension claims of all classes, settled by allowance and rejection each year since 1881.

Table No. 14 shows the issue of certificates from this Bureau during the fiscal year, a grand total of 151,658. This table also shows that during the year 66,637 original certificates were issued.

Table No. 15 shows in brief the operations of the special examination division during the year. It sets forth the number of claims acted upon by said division, the amount recovered and saved, and the expenditure on account thereof, except salaries.

Table No. 16 shows the number of names and addresses furnished to different divisions of this Bureau and to claimants in the consideration of pending claims during the year; a total of 290,176.

Table No. 17 shows the work done by the mail division of this Bureau during the year. It shows that \$17,842.19 were received in money, and that 9,896 postage stamps were received. It further shows that 3,552,350 pieces of mail-matter were received, examined, and distributed to the proper divisions of the Bureau, after being recorded, of which 916,835 were letters of inquiry. It also appears from said table that 2,211,273 letters were sent out during the year.

Table No. 18 shows the number of pensioners in each county of each State and Territory of the United States and in each foreign country on the pension rolls June 30, 1890.

The summary of this table shows the number of pensioners in each State and Territory of the United States and in foreign countries on the pension rolls June 30, 1890.

Table No. 19 presents what is regarded as an interesting statement of the names, ages, and post-office addresses of persons still remaining on the rolls who are pensioned as the widows or children of soldiers of the Revolutionary war. It will be seen that there are 23 widows and 2 children.

TABLE NO. 1.—*Number of pensions allowed and increased during the year, with the annual value of all pensions on the roll.*

Year ending June 30, 1890.	Pensions allowed and increased during the year.						Dropped from the roll.		Reductions in rate.		Number of pen- sioners June 30, 1890.	Annual value of pensions as shown by roll June 30, 1890.
	Original.		Increase.		Restoration.							
	No.	Annual value.	No.	Annual value.	No.	Annual value.	No.	Annual value.	No.	Annual value.		
Army	49,453	\$4,505,214.00	76,511	\$4,264,216.29	1,711	\$150,500.04	9,839	\$1,680,805.50	55	\$6,195.00	392,809	\$51,260,064.49
	14,323	2,208,158.00	120	4,136.00	153	17,184.00	7,610	1,051,765.00	2,788	80,520.00	104,456	15,962,906.00
	942	107,912.00	901	43,883.00	31	2,174.00	249	43,038.00	1	48.00	5,274	756,043.00
	335	57,476.00	7	1,200.00	1	144.00	142	19,322.00	63	- 1,872.00	2,460	488,148.00
	4	354.00	2	609.00	.....	.....	194	18,694.00	.....	.....	413	44,820.00
	108	15,552.00	1	.....	4	576.00	1,460	211,104.00	.....	.....	8,610	1,230,840.00
	794	76,294.00	21	1,332.00	.....	.....	701	67,296.00	.....	.....	17,158	1,650,552.00
	678	65,088.00	.....	.....	1	96.00	121	11,616.00	.....	.....	9,764	1,649,680.00
	66,637	7,496,008.00	77,563	4,315,367.29	1,901	179,680.04	20,319	3,103,570.50	2,907	88,635.00	537,944	73,002,143.49
	Total											

NOTE.—Average annual value of each pension on the roll June 30, 1890, \$133.94.

TABLE NO. 2.—Number of pensioners of the various classes dropped from the rolls during the year, with the cause, and the number of each class on the rolls June 30, 1890.

Causes for which dropped.	Army and Navy invalids.	Army and Navy widows, minor children, and dependent relatives.	Classification of widows' roll.							War of 1812.			War with Mexico.			Total number of pensioners of all classes.
			Widows without chil.	Widows with children.	Minors.	Mothers.	Fathers.	Brothers and sisters dependent sons and daughters.	Total number of chil.	Survivors.	Widows.	Total.	Survivors.	Widows.	Total.	
Loss to the roll:																
By deaths reported	8,348	9,566	1,152	241	21	1,581	563	2	968	181	1,359	1,539	608	107	716	14,169
By remarriage		1,688	401	1,096		31			3,641		2	2		4	4	1,694
Minors by legal limitation		1,462			1,462				6,924							1,462
Failure to claim pension (Sec. 4719, R. S.)	596	683	245	53		280	105		157	10	83	92	1		1	1,373
Dropped for other causes	1,141	453	171	201	2	52	27		1,062	3	34	27	91	16	161	1,723
Total loss to roll	10,085	7,792	2,059	1,591	1,485	1,944	701	2	12,632	194	1,466	1,660	701	171	872	20,319
Number of pensioners on roll June 30, 1890	398,083	106,910	53,436	15,521	3,058	28,463	6,368	40	29,753	413	8,610	9,023	17,158	6,764	23,922	537,944

TABLE NO. 3.—*The financial operations of the United States Bureau of Pensions for the fiscal year 1890.*

	Army pensions.							Navy pensions.		Arrears of pensions.		
	Pensions.	Fees of examining surgeons.	Salary.	Clerk hire.	Rent.	Fuel.	Lights.	Con- tingent ex- penses.	Pensions.	Fees of examining surgeons.	Army.	Navy.
Balance arrears fund on hand July 1, 1889.....											\$351,706.83	\$72,088.00
Amount appropriated act March 1, 1889.....	\$78,473,000.00	\$988,000.00	\$72,000.00	\$178,000.00	\$18,200.00	\$750.00	\$750.00	\$16,000.00	\$2,000,000.00	\$12,000.00		
Amount deficiency appropriation act April 4, 1890.....	21,598,834.00			14,175.00								
Amount deficiency appropriation act June 18, 1890.....	3,708,898.35											
Amount transferred from Navy fund.....	90,000.00											
Amount refunded by agents upon execution of new bonds, etc....	3,743,550.00	179,174.46	4,150.02	15,000.51	828.80	190.15	190.90	1,500.15	283,512.07	2,309.50	74,674.83	
Total.....	107,614,283.04	1,167,174.46	76,150.02	207,175.51	19,028.99	940.15	940.90	17,500.15	2,285,512.07	14,309.50	428,381.75	72,088.00
Amount of advances to agents.....	107,607,654.35	1,016,197.75	76,083.38	207,176.51	13,294.49	800.00	725.00	17,500.15	2,195,000.00	13,300.00	125,000.00	
Amount disbursed by Treasury settlement.....	3,837.54	63.20										
Amount transferred to Army fund.....									90,000.00			
Total.....	107,611,495.89	1,016,260.95	76,083.38	207,175.51	13,294.49	800.00	725.00	17,500.15	2,285,000.00	13,300.00	125,000.00	
Balance on hand June 30, 1890.....	2,787.15	150,913.51	66.64		5,724.50	140.15	215.90		512.07	1,000.50	201,381.75	72,088.00

TABLE No. 4.—Amount disbursed at United States pension agencies during the fiscal year ending June 30, 1890, as shown by accounts current.

Agencies.	Army pensions.					Navy pensions.					Arrears of pensions.		Grand total.		
	Pensions.	Fees of examining surgeons.	Salary.	Clerk hire.	Rent.	Fuel.	Light.	Contin- gent ex- penses.	Total.	Pensions	Fees of exam- ining sur- geons.	Total.		Army.	Navy.	Total.
Albany.....	\$2,257,710.01	\$1,479,004.00	\$1,022.00	\$1,022.00	\$380.00	\$83.00	\$14.40	\$530.64	\$2,672,139.74	\$500,057.70	\$731.40	\$500,789.10	\$364.12		\$2,672,139.74
Boston.....	6,600,061.00	6,347.79	2,400.00	10,440.99				395.18	6,521,444.50				1,978.32		6,521,444.50
Buffalo.....	5,700,971.00	8,405.04	4,000.00	10,614.02				624.00	5,724,990.04				1,978.32		5,724,990.04
Chicago.....	8,099,853.04	14,012.35	4,000.00	16,660.34				1,129.56	8,645,904.99	337,724.15	814.00	338,538.15	270.27		8,645,904.99
Columbia.....	11,161,983.62	21,003.95	4,000.00	20,779.28				1,407.00	11,209,300.85				3,320.20		11,209,300.85
Concord.....	2,874,751.09	4,314.44	4,000.00	5,324.61				800.00	2,888,390.17				673.20		2,888,390.17
Des Moines.....	6,397,230.00	11,000.37	4,000.00	10,600.64				489.74	6,422,650.75				757.60		6,422,650.75
Detroit.....	5,455,009.77	11,247.24	4,000.00	10,437.50				730.00	5,485,741.11				1,094.74		5,485,741.11
Indianapolis.....	9,894,859.44	18,078.55	4,000.00	18,247.00				1,437.44	9,939,048.97				717.47		9,939,048.97
Knoxville.....	4,717,092.18	5,058.00	4,000.00	8,166.10				417.54	4,734,318.73				717.47		4,734,318.73
Louisville.....	3,524,662.08	0,197.75	4,000.00	2,067.00				450.00	3,530,287.88				374.80		3,530,287.88
Milwaukee.....	3,773,803.80	0,136.23	4,000.00	9,350.19				715.42	3,788,262.64				77.09		3,788,262.64
New York.....	4,781,143.24	6,405.20	4,000.00	11,630.81				1,872.27	4,800,181.84	305,094.60	370.10	305,464.70	77.09		4,800,181.84
Philadelphia.....	5,081,270.61	10,805.03	4,000.00	10,340.60				738.40	5,106,617.63	278,482.83	400.00	278,882.83	528.97		5,106,617.63
Pittsburgh.....	4,537,328.77	8,323.44	4,000.00	8,582.76				1,005.00	4,558,235.97						4,558,235.97
San Francisco.....	1,430,307.78	1,403.75	4,000.00	2,748.72				295.00	1,438,375.25	51,471.69	86.00	51,557.69			1,438,375.25
Tampa.....	9,403,374.18	20,732.45	4,000.00	14,022.77				354.00	9,448,153.40				2,310.88		9,448,153.40
Washington.....	8,196,999.61	109,227.78	4,000.00	13,212.76				1,000.15	8,229,450.15	353,415.06	8,408.89	361,813.95	2,227.00		8,229,450.15
Total.....	103,689,813.15	15,962,233.07	72,000.00	191,291,001.21	405,504.86	430,101.16	16,023,911.04	644,763.57	1,823,146.09	10,730.39	1,833,870.48	16,220.63			1,823,146.09

In addition to the above, there were disbursed during the fiscal year ending June 30, 1890, the following sums chargeable to the appropriations for the fiscal year ending June 30, 1890:

Fees of examining surgeons, Army pensions.....	\$213,835.41
Fees of examining surgeons, Navy pensions.....	8,683.85
Total.....	217,708.70

TABLE No. 5.—*Showing the number and amount of first payments on each class of certificates made during the fiscal year 1890 by the pension agents to each class of pensioners, as well as the number of cases of each class on hand unpaid June 30, 1890, and the amount of the first payments due thereon.*

Class of cases.	PAID.						UNPAID.					
	Original.		Increase.		Re-issue.		Restoration.		Number and total amount of first payments during year.		Total number of certificates unpaid and the amount due thereon June 30, 1890.	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
Army.....	49,540	\$18,954,509.67	52,850	\$1,802,648.45	8,400	\$3,623,547.35	1,422	\$653,216.00	112,222	\$24,903,920.47	18,241	\$2,545,164.40
{ Invalids.....	14,390	12,548,235.73	39	8,783.20	75	36,846.23	117	96,832.64	14,621	13,689,097.63	1,914	1,692,712.75
{ Widows, etc.....	916	322,884.11	591	12,640.53	100	33,855.18	24	6,733.05	1,031	876,112.87	246	51,313.07
Navy.....	359	306,485.19	6	190.94	9	8,274.06	.....	.....	374	317,650.19	33	20,050.08
{ Invalids.....	4	4,272.80	.....	.....	.....	.....	.....	.....	4	4,272.80	2	1,157.34
{ Widows, etc.....	107	108,917.47	.....	.....	.....	.....	.....	.....	107	108,917.47	15	13,765.16
War of 1812.....	898	136,965.88	1	5.67	3	290.13	1	162.40	872	137,424.08	103	19,143.92
{ Invalids.....	683	92,670.33	.....	.....	.....	.....	.....	.....	683	92,670.33	84	14,038.06
{ Widows, etc.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
War with Mexico.....	66,867	32,478,841.18	53,497	1,884,268.79	8,586	3,601,812.97	1,664	756,943.09	130,514	38,721,866.03	20,638	4,357,347.90
{ Invalids.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
{ Widows, etc.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Amount paid as fees to attorneys during the year, \$2,066,700.45.

Average value of original payments made during 1890, \$485.71.

Average value of original payments due but not made during 1890, \$494.21.

The 20,038 certificates unpaid June 30, 1890, upon which there was due the sum of \$4,357,347.90, will be paid out of the appropriation for the fiscal year 1891.

TABLE NO. 6.—Statement of amounts paid for pensions to the survivors of the war of 1812 and to the widows of those who served in that war since 1871, and to the survivors of the war with Mexico and to the widows of those who served in that war since 1857.

Fiscal year of—	War of 1812.			War with Mexico.		
	Survivors.	Widows.	Total disbursements.	Survivors.	Widows.	Total disbursements.
1871 (from Feb. 14, 1871).....	82,555.05	\$311.00	\$3,086.05			
1872.....	1,077,415.84	335,909.63	2,313,409.47			
1873.....	2,078,606.98	689,504.50	2,767,016.35			
1874.....	1,588,332.95	616,026.40	2,204,359.35			
1875.....	1,365,599.86	533,006.21	1,898,606.07			
1876.....	1,089,037.18	445,772.95	1,534,810.13			
1877.....	934,657.82	361,648.91	1,296,306.73			
1878 (from Mar. 9, 1878).....	768,918.47	294,572.05	1,063,490.52			
1879.....	1,014,325.66	2,192,699.54	3,207,025.20			
1880.....	700,710.39	2,658,058.14	3,358,768.53			
1881.....	691,612.80	2,381,800.95	3,073,413.75			
1882.....	478,274.85	2,024,707.64	2,502,982.49			
1883.....	357,334.81	1,842,542.41	2,200,877.22			
1884.....	274,888.25	1,680,902.09	1,955,790.34			
1885.....	207,782.50	1,518,302.00	1,726,084.50			
1886.....	144,389.59	1,358,896.44	1,503,286.03			
1887.....	105,837.01	1,765,582.36	1,871,419.37	353,148.68	82,458.08	855,606.76
1888.....	73,659.48	1,596,604.96	1,670,264.44	1,861,736.07	583,056.28	2,444,792.35
1889.....	52,806.27	1,397,487.00	1,450,293.27	1,700,809.30	694,572.43	2,395,381.73
1890.....	38,847.09	1,264,239.27	1,303,086.36	1,728,027.54	695,054.90	2,423,082.44
Total.....	13,960,267.75	25,102,942.11	39,063,209.86	5,430,831.60	1,974,141.71	7,404,973.30

TABLE NO. 7.—A classified statement of the number of pensioners on the rolls of each agency compared with the number on the rolls June 30, 1899.

Location of Agency.	Army.		Navy.		War of 1812.		War with Mexico.		Number of pensioners on the rolls June 30, 1899.	Number of pensioners on the rolls June 30, 1899.
	Invalids.	Widows, etc.	Invalids.	Widows, etc.	Survivors.	Widows.	Survivors.	Widows.		
Columbus.....	43,478	11,179			35	644	637	262	56,233	49,591
Indianapolis.....	40,052	8,713			12	331	760	326	50,190	44,600
Chicago.....	32,904	8,322	1,049	321	16	372	1,139	619	44,642	41,004
Topeka.....	34,332	6,437			21	389	2,148	765	44,082	38,370
Washington.....	23,362	4,809	954	537	60	1,070	1,634	487	32,910	30,330
Des Moines.....	26,847	4,296			13	262	624	180	32,261	29,256
Roston.....	19,368	8,487	1,484	726	17	591	234	114	31,021	26,696
Buffalo.....	22,350	7,273			73	703	157	64	30,999	25,660
Philadelphia.....	19,738	7,942	799	403	4	339	435	240	22,306	27,616
Milwaukee.....	23,648	4,780			10	139	369	107	29,653	26,384
Detroit.....	22,130	4,415			15	240	256	87	27,143	24,183
New York.....	10,517	6,883	816	440	26	499	615	233	35,927	34,316
Knoxville.....	11,580	4,731			46	1,599	4,784	2,464	25,230	23,111
Pittsburgh.....	18,985	3,805			11	273	220	80	24,802	23,306
Louisville.....	10,757	3,085			13	374	810	384	16,023	13,997
Concord.....	11,512	3,565			11	355	61	23	15,427	14,709
Augusta.....	10,493	3,490			29	518	70	23	14,565	13,913
San Francisco.....	4,808	626	173	83	5	66	2,206	411	5,415	7,538
Total number of pensioners.....	392,809	104,458	5,274	2,460	413	8,610	17,158	6,764	537,944	489,726
Increase during year..	41,325	6,866	727	194			93	558	48,219	
Decrease during year..					190	1,354				

TABLE NO. 8.—Statement showing the different monthly rates of pension, and the number pensioned at each rate, of the Army and Navy invalids, and of the Army and Navy widows, minors, and dependents (war of 1861) on the rolls, June 30, 1890.

Rates.	Invalids.			Widows and others.			Rates.	Invalids.			Widows and others.		
	Army.	Navy.	Total.	Army.	Navy.	Total.		Army.	Navy.	Total.	Army.	Navy.	Total.
\$1.00	25	1	26	.....	.....	.....	\$17.25	1	2	3	.....	.....	.....
2.00	21,001	231	21,232	.....	.....	.....	17.50	16	5	21	.....	.....	.....
2.25	1	.....	1	.....	.....	.....	17.75	3	.....	3	.....	.....	.....
2.66½	7	.....	7	.....	.....	.....	18.00	4,212	47	4,259	44	.....	44
3.00	1,247	32	1,279	.....	.....	.....	18.25	.....	4	4	.....	.....	.....
3.25	1	.....	1	.....	.....	.....	18.50	16	1	17	.....	.....	.....
3.75	210	9	219	.....	.....	.....	18.75	114	4	118	.....	.....	.....
4.00	70,885	901	71,786	.....	.....	.....	19.00	14	3	17	.....	.....	.....
4.25	243	.....	243	.....	.....	.....	19.25	9	.....	9	.....	.....	.....
5.00	942	68	1,010	.....	.....	.....	19.50	.....	1	1	.....	.....	.....
5.25	2	.....	2	.....	.....	.....	20.00	4,293	95	4,388	2,370	144	2,514
5.33½	10	1	11	.....	.....	.....	20.75	2	3	5	.....	.....	.....
5.66½	4	.....	4	.....	.....	.....	21.00	3	1	4	.....	.....	.....
5.75	11	.....	11	.....	.....	.....	21.25	65	.....	65	.....	.....	.....
6.00	53,586	525	54,111	.....	.....	.....	21.50	1	.....	1	.....	.....	.....
6.25	57	3	60	.....	.....	.....	22.00	2,565	58	2,623	.....	.....	.....
6.37½	3	.....	3	.....	.....	.....	22.50	99	4	103	.....	.....	.....
6.75	2	.....	2	.....	.....	.....	23.00	4	.....	4	.....	.....	.....
7.00	136	3	139	.....	.....	.....	23.25	2	.....	2	.....	.....	.....
7.25	.....	2	2	.....	.....	.....	23.50	.....	1	1	.....	.....	.....
7.50	599	12	611	.....	.....	.....	23.75	1	.....	1	.....	.....	.....
7.75	11	2	13	.....	.....	.....	24.00	17,065	256	17,321	4	.....	4
8.00	77,835	1,092	78,927	575	19	594	24.50	2	1	3	.....	.....	.....
8.25	15	.....	15	.....	.....	.....	25.00	2,569	66	2,637	641	127	768
8.50	769	1	770	.....	.....	.....	25.25	1	.....	1	.....	.....	.....
8.66½	1	.....	1	.....	.....	.....	25.75	.....	3	3	.....	.....	.....
8.75	5	2	7	.....	.....	.....	26.00	1	.....	1	.....	.....	.....
9.00	514	4	518	.....	.....	.....	26.25	6	.....	6	.....	.....	.....
9.25	16	.....	16	.....	.....	.....	26.50	1	2	3	.....	.....	.....
9.50	18	7	25	.....	.....	.....	26.75	1	.....	1	.....	.....	.....
9.75	6	4	10	.....	.....	.....	27.00	816	23	839	.....	.....	.....
10.00	30,709	402	31,111	2	1	3	27.50	11	.....	11	.....	.....	.....
10.20	1	.....	1	.....	.....	.....	28.00	1	.....	1	.....	.....	.....
10.25	6	2	8	.....	.....	.....	29.00	1	.....	1	.....	.....	.....
10.50	18	10	28	.....	.....	.....	29.50	1	.....	1	.....	.....	.....
10.62	1	.....	1	.....	.....	.....	30.00	12,193	210	13,403	610	209	819
10.66½	1	.....	1	.....	.....	.....	30.75	2	.....	2	.....	.....	.....
10.75	1	14	15	.....	.....	.....	31.00	1	.....	1	.....	.....	.....
11.00	80	7	87	.....	.....	.....	31.25	56	.....	56	.....	.....	.....
11.25	296	12	308	.....	.....	.....	32.00	8	4	12	.....	.....	.....
11.33½	4	.....	4	.....	.....	.....	32.50	1	.....	1	.....	.....	.....
11.50	20	5	25	.....	.....	.....	33.00	1	.....	1	.....	.....	.....
11.75	9	3	12	.....	.....	.....	33.50	3	2	5	2	.....	2
12.00	35,825	407	36,232	96,590	1,792	98,382	35.00	3	.....	3	.....	.....	.....
12.25	13	.....	13	.....	.....	.....	35.50	8	.....	8	.....	.....	.....
12.50	187	21	208	1	.....	1	36.00	3,191	39	3,230	.....	.....	.....
12.75	448	1	449	.....	.....	.....	37.00	1	.....	1	.....	.....	.....
13.00	475	8	483	.....	.....	.....	37.50	.....	1	1	1	.....	1
13.25	7	9	16	.....	.....	.....	38.50	.....	1	1	.....	.....	.....
13.33½	4	.....	4	.....	.....	.....	49.00	38	.....	38	8	3	11
13.50	24	5	29	.....	.....	.....	40.25	1	.....	1	.....	.....	.....
13.75	9	1	10	.....	.....	.....	45.00	2,568	23	2,591	2	.....	2
14.00	12,753	111	12,864	1	.....	1	46.00	1	.....	1	.....	.....	.....
14.25	15	3	18	.....	.....	.....	49.00	2	.....	2	.....	.....	.....
14.50	3	2	5	.....	.....	.....	50.00	843	9	852	55	47	102
14.75	6	.....	6	.....	.....	.....	53.00	1	.....	1	.....	.....	.....
14.87½	1	.....	1	.....	.....	.....	57.00	1	.....	1	.....	.....	.....
15.00	2,801	93	2,894	1,829	110	1,939	60.00	1	.....	1	.....	.....	.....
15.25	1	.....	1	.....	.....	.....	72.00	2,258	66	2,324	.....	.....	.....
15.50	4	3	7	.....	.....	.....	75.00	.....	.....	.....	4	.....	4
15.75	7	7	14	.....	.....	.....	100.00	20	3	23	7	2	9
16.00	15,813	162	15,975	.....	.....	.....	166.66½	.....	.....	.....	3	.....	3
16.25	2	11	13	.....	.....	.....	208.33½	.....	.....	.....	1	.....	1
16.50	9	5	14	.....	.....	.....	416.66½	.....	.....	.....	3	.....	3
16.75	14	.....	14	.....	.....	.....	Total	392,809	5,274	398,083	104,456	2,400	106,856
17.00	10,981	121	11,102	2,263	4	2,267							

TABLE NO. 9.—List of pension agencies, with location, geographical limits, showing the balance of funds in the hands of each agent June 30, 1890.

Location.		Name of agent.	Amount.	Geographical limits.
City.	State.			
Augusta.....	Maine.....	Joseph A. Clark.....	\$7,357.62	The State of Maine; Navy pensioners in this district paid at Boston, Mass.
Boston.....	Massachusetts.....	Benj. F. Peach, Jr.....	9,614.18	The States of Connecticut, Massachusetts and Rhode Island, and all Navy pensioners residing in this and the Augusta and Concord districts.
Buffalo.....	New York.....	Jacob Schenkelsberger.....	7,885.85	The counties in the State of New York not in the New York City district: All Navy pensioners in the State are paid at New York City.
Chicago.....	Illinois.....	Lamar Clements.....	9,252.81	The State of Illinois and all Navy pensioners residing in this and the Columbia, Des Moines, Detroit, Indianapolis, Louisville, Milwaukee, and Topeka districts.
Columbus.....	Ohio.....	John G. Mitchell.....	16,645.58	The State of Ohio: Navy pensioners in this district paid at Chicago.
Concord.....	New Hampshire.....	W. H. D. Cochran.....	10,577.22	The States of New Hampshire and Vermont: Navy pensioners in this district paid at Boston.
Des Moines.....	Iowa.....	Stephen A. Marino.....	9,600.00	The States of Iowa and Nebraska: Navy pensioners in this district paid at Chicago.
Detroit.....	Michigan.....	Edward B. Harvey.....	17,070.47	The State of Michigan: Navy pensioners in this district paid at Chicago.
Indianapolis.....	Indiana.....	Nicholas Endley.....	14,230.73	The State of Indiana: Navy pensioners in this district paid at Chicago.
Knoxville.....	Tennessee.....	William Hale.....	10,468.73	The States of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Texas: Navy pensioners in this district paid at Washington, D. C.
Louisville.....	Kentucky.....	C. J. Walton.....	7,017.49	The State of Kentucky: Navy pensioners in this district paid at Chicago.
Milwaukee.....	Wisconsin.....	Levi E. Pond.....	91,534.79	The States of Minnesota, North Dakota, South Dakota, and Wisconsin: Navy pensioners in this district paid at Chicago.
New York.....	New York.....	Frank C. Loveland.....	52,022.51	The counties in the State of New York of Albany, Clinton, Columbia, Delaware, Dutchess, Essex, Greene, Kings, Queens, New York, Orange, Putnam, Richmond, Rockland, Saratoga, Schoharie, Sullivan, Suffolk, Ulster, Warren, Washington, and Westchester. All Navy pensioners in the State of New York, and all pensioners residing in the counties of the State of New Jersey of Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, and Warren.
Philadelphia.....	Pennsylvania.....	William H. Sheldrake.....	23,914.47	The counties in the State of Pennsylvania of Berks, Bradford, Bucks, Carbon, Chester, Columbia, Dauphin, Delaware, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Monroe, Montgomery, Montour, Northampton, Northumberland, Philadelphia, Pike, Schuylkill, Sullivan, Susquehanna, Wayne, Wyoming, and York, all Navy pensioners in the State of Pennsylvania, and all pensioners residing in the counties in the State of New Jersey of Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, and Salem.
Pittsburgh.....	.....do.....	William H. Barclay.....	7,532.90	The counties in the State of Pennsylvania not in Philadelphia district. All Navy pensioners in the State are paid at Philadelphia.
San Francisco.....	California.....	Truman H. Allen.....	55,218.62	The States of California, Idaho, Montana, Nevada, Oregon, Washington, and Wyoming, the Territories of Alaska, Arizona, and Utah, including the Navy pensioners.
Topeka.....	Kansas.....	Bernard Kelly.....	8,364.16	The States of Colorado, Kansas and Missouri; the Territories of New Mexico, Oklahoma, and the Indian Territory: Navy pensioners in this district are paid at Chicago.
Washington.....	District of Columbia.....	Sidney L. Willson.....	208,835.34	The States of Delaware, Maryland, Virginia, and West Virginia, and the District of Columbia, the inmates of the branches of the National Soldiers' Home, and pensioners residing in foreign countries, and all Navy pensioners in this and the Knoxville district.
			560,283.87	

TABLE NO. 10.—Number of pension claims filed and allowed each year since July, 1861, and the number of pensioners on the rolls at the close of each year, together with the annual amount paid on account of pensions since July 1, 1880.

Fiscal year ending June 30—	Army.		Navy.		Army and Navy.		War of 1812.				Total number of applications filed.	Total number of claims allowed.	Number of pensioners on the roll.		Disbursements.	
	Applications filed.		Applications filed.		Claims allowed.		Applications filed.		Claims allowed.				Invalids.	Widows, etc.		
	Invalids.	Widows, etc.	Invalids.	Widows, etc.	Invalids.	Widows, etc.	Surviv-ers.	Widows.	Surviv-ers.	Widows.						
1861.....	1,362	1,000	60	65	413	49	.....	.....	.....	.....	2,467	402	4,337	4,299	\$1,072,461.58
1862.....	26,380	22,377	290	285	3,703	3	.....	.....	.....	.....	49,332	7,884	4,341	3,818	8,159
1863.....	30,953	52,627	585	354	17,041	22,446	.....	.....	.....	.....	53,590	39,487	7,821	6,970	1,025,130.91
1864.....	27,980	44,464	455	406	15,011	24,059	.....	.....	.....	.....	73,684	39,487	23,479	27,656	51,135
1865.....	35,799	28,732	350	375	22,883	27,284	.....	.....	.....	.....	65,256	50,177	55,959	50,166	85,980
1866.....	16,697	29,365	250	333	16,589	19,461	.....	.....	.....	.....	30,768	28,031	69,565	83,618	129,729
1867.....	7,292	13,499	170	207	9,460	19,461	.....	.....	.....	.....	20,768	28,031	75,067	83,618	158,163
1868.....	11,035	14,499	200	245	7,292	15,904	.....	.....	.....	.....	20,768	28,031	105,104	167,063	242,884.09
1869.....	12,891	11,400	260	200	6,721	12,500	.....	.....	.....	.....	24,851	18,231	97,521	199,686	277,900.81.81
1870.....	8,857	9,965	190	145	7,934	8,390	108	.....	.....	.....	43,969	16,503	93,304	114,101	207,495
1871.....	8,857	8,755	240	178	6,468	7,244	31	.....	.....	.....	30,391	16,932	113,954	118,275	239,229
1872.....	8,738	6,437	248	126	6,651	4,073	3,117	.....	.....	.....	18,393	16,932	113,954	118,911	238,411
1873.....	9,362	6,033	238	151	5,937	3,132	3,189	.....	.....	.....	16,734	10,482	131,613	114,613	236,241
1874.....	11,026	6,394	310	178	5,760	4,736	810	.....	.....	.....	16,734	10,482	131,613	114,613	236,241
1875.....	17,030	5,594	344	139	5,760	4,736	2,440	.....	.....	.....	16,734	10,482	131,613	114,613	236,241
1876.....	16,532	5,369	371	187	7,292	3,831	73	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1877.....	18,812	6,661	300	131	7,414	3,556	126	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1878.....	36,835	9,767	599	215	7,414	3,556	817	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1879.....	110,478	25,602	559	215	7,414	3,556	817	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1880.....	18,435	10,527	515	225	10,176	4,455	18,177	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1881.....	30,094	10,349	472	211	22,046	3,990	18,177	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1882.....	28,952	11,878	671	244	27,414	5,363	18,177	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1883.....	27,959	11,557	735	277	27,590	5,363	18,177	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1884.....	35,293	13,759	836	698	35,293	11,217	426	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1885.....	47,505	18,444	1,751	579	36,835	10,924	426	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1886.....	52,153	23,067	1,312	779	40,492	14,612	426	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1887.....	71,570	28,365	2,102	788	40,492	14,612	426	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1888.....	78,648	30,830	2,102	788	40,492	14,612	426	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1889.....	106,483	38,000	2,102	788	40,492	14,612	426	.....	.....	.....	23,523	9,977	124,239	107,898	232,137
1890.....	1,158,712	303,365	10,184	8,000	278,094	34,917	25,703	.....	.....	.....	1,353,190	885,758	.....	.....	.....
Total.....	788,190	429,090	16,184	8,000	490,492	278,094	34,917	44,872	25,703	36,268	1,353,190	885,758	.....	.....	.....

In the total number of applications filed in 1890 are included 1,009 survivors and 968 widows of the war with Mexico. In the number of pensioners on the rolls at the close of 1890 are included 794 survivors and 678 widows of the war with Mexico. In the number of pensioners on the roll under the heads of "invalids" and "widows, etc.," are included survivors and widows of the war of 1812, respectively, commencing with the year 1871, and survivors and widows of the war with Mexico, commencing with the year 1887.

TABLE No. 11.—*Army invalid claims allowed each year since July 1, 1861, showing in report years, giving also the whole number filed each year and*

Years in which the claims were filed.	The several years in which the claims were allowed and the number allowed each year.																
	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	
1862	305	258	131	27	19	20	12	11	12	29	6	6	10	4	3	7	
1863	3,697	9,331	1,138	517	363	235	185	143	293	154	110	129	159	121	139		
1864		7,303	3,459	844	562	253	166	114	239	139	96	167	101	84	126		
1865			10,045	7,819	1,863	645	417	223	382	194	132	160	92	66	113		
1866				12,724	9,292	2,511	1,156	529	732	440	251	211	185	145	187		
1867					3,580	3,626	1,132	525	734	349	350	149	153	88	134		
1868						1,641	1,662	421	502	218	196	172	89	56	62		
1869							2,238	2,208	1,264	493	300	182	142	124	97		
1870								1,040	3,094	1,639	799	441	279	167	197		
1871									342	1,946	1,056	438	345	214	149		
1872										434	1,638	1,018	371	278	276		
1873											1,322	1,762	674	342	461		
1874												794	1,869	606	569		
1875													937	2,243	1,169		
1876														624	2,363		
1877															777		
1878																	
1879																	
1880																	
1881																	
1882																	
1883																	
1884																	
1885																	
1886																	
1887																	
1888																	
1889																	
1890																	
Total..	305	3,915	16,765	14,669	21,923	15,718	8,963	6,991	5,215	7,612	6,018	8,261	5,519	6,397	5,193	7,162	

NOTE.—The number (71,318) of invalid claims filed in 1890, as reported in this table, excludes 252 old

each year's allowance the number of those which were filed each year and allowed in the the percentage of the number allowed out of those filed each year.

The several years in which the claims were allowed and the number allowed each year.														Number of invalid claims filed each year.	Per cent. of claims allowed of each year's filing.
1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	Total.		
4	5	24	78	38	18	9	10	15	17	9	10	7	1,109	1,862	81.4
147	135	241	415	393	384	263	289	269	218	220	191	185	19,538	26,380	74.0
160	160	228	365	328	265	240	264	220	220	194	142	138	19,482	26,263	81.3
122	92	172	345	284	284	190	204	188	160	110	125	121	24,481	27,299	69.6
202	158	257	477	368	335	285	238	219	208	177	130	130	31,615	35,799	88.0
189	104	180	320	281	262	202	263	187	184	151	107	97	13,328	15,965	83.8
59	49	109	177	89	124	99	196	80	62	61	52	51	6,285	7,232	86.2
102	54	143	312	267	208	160	282	141	141	115	82	99	9,195	11,036	83.3
132	121	220	451	379	319	243	363	239	234	164	138	115	10,762	12,691	82.8
125	100	228	368	293	243	218	241	211	165	125	116	116	7,641	8,837	79.7
214	153	251	404	328	288	231	314	225	193	144	116	110	6,967	8,857	78.9
263	123	287	454	300	27	309	221	197	186	161	103	106	7,466	8,728	85.5
248	188	324	497	384	312	213	385	254	213	160	117	128	7,295	9,302	78.4
493	273	455	756	659	478	349	401	323	277	239	158	178	9,336	11,926	78.3
1,444	608	738	1,219	905	773	579	630	570	565	413	316	338	12,730	17,030	74.8
2,171	1,464	1,063	1,370	1,050	1,006	706	740	698	618	444	331	340	13,027	16,332	79.8
908	2,568	1,806	2,385	1,400	966	888	879	816	773	539	413	475	14,856	18,812	78.9
.....	776	2,693	7,767	4,865	4,116	2,296	2,045	1,819	1,618	1,063	636	870	30,762	36,835	83.5
.....	.....	263	2,358	9,825	17,620	12,277	9,706	9,329	7,880	5,619	3,885	4,159	93,131	110,673	75.1
.....	.....	.....	155	157	1,360	1,651	1,499	1,533	1,493	1,169	999	1,030	10,878	18,465	58.9
.....	.....	.....	133	1,485	2,326	2,245	2,667	2,326	2,038	1,512	1,709	16,841	29,064	57.4	
.....	.....	.....	.....	882	2,579	2,517	3,279	3,188	2,720	2,090	3,303	19,258	36,039	51.9	
.....	.....	.....	.....	.....	917	2,434	3,092	2,730	2,363	1,834	1,929	15,305	23,962	52.8	
.....	.....	.....	.....	.....	.....	819	3,961	3,443	2,699	2,098	2,182	15,070	27,959	53.9	
.....	.....	.....	.....	.....	.....	.....	883	5,842	5,428	3,849	3,714	16,711	35,202	53.9	
.....	.....	.....	.....	.....	.....	.....	.....	1,506	5,383	5,317	4,967	18,173	36,204	50.2	
.....	.....	.....	.....	.....	.....	.....	.....	.....	2,291	9,499	9,240	20,973	47,349	44.3	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,657	12,189	13,737	51,919	26.5	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,407	2,407	71,818	2.3	
7,303	7,073	9,718	26,912	22,615	31,758	27,117	27,225	31,552	34,702	35,089	33,990	40,453	477,482	787,260	.....

war invalid claims, which are included in the number (71,579) of such claims as reported in table No. 18.

TABLE NO. 12.—*Number of claims of each class filed, admitted, and rejected during the*

Fiscal year ending June 30, 1890.	Army.						Navy.		
	Invalid.			Widows, etc.			Invalid.		
	Original.	Increase.	Total.	Original.	Increase.	Total.	Original.	Increase.	Total.
Claims on the files June 30, 1889.....	284, 710	232, 596	517, 306	134, 321	748	135, 069	7, 992	1, 722	9, 714
Claims filed during the year	71, 576	172, 188	243, 758	28, 305	386	28, 751	2, 162	1, 909	4, 671
Total	356, 286	404, 784	761, 064	162, 626	1, 134	163, 820	10, 154	3, 631	13, 785
Claims admitted	49, 453	76, 511	125, 964	14, 323	120	14, 443	942	901	1, 843
Claims rejected	8, 120	96, 013	107, 133	5, 791	50	5, 841	392	977	969
Total disposed of ..	57, 573	175, 524	233, 097	20, 114	170	20, 284	1, 334	1, 878	3, 212
Claims pending June 30, 1890	180, 801	228, 260	410, 061	78, 446	964	79, 410	4, 203	1, 753	5, 956
Claims on rejected files June 30, 1890	126, 026	...	126, 026	69, 917	.....	69, 917	5, 009	.....	5, 009
Total June 30, 1890 ..	306, 827	228, 260	536, 087	148, 363	964	149, 327	9, 212	1, 753	10, 965

Under the head of "Widows, etc.," in the Army and Navy classes are included minor children and dependent relatives.

There were received during the year 220 applications for bounty-land warrants; 91 were issued, and 104 applications were rejected; at the close of the year 867 applications were pending, and 23, 734 were on the rejected files.

There were allowed during the year 37 claims for arrears of pension in the case of those who were in receipt of a pension January 25, 1879, and granted arrears by the act of that date.

year, and the comparative condition of the files at the beginning and close of the year.

Navy.			Army and Navy res- tations.	Total Army and Navy.	War of 1812.				Mexican war, not of Jan- uary 29, 1837.		Total number of origi- nal claims.	Aggregate of all claims.
Widows, etc.					Survivors.		Widows.		Survivors, original.	Widows, original.		
Original.	Increase.	Total.			Original.	Increase.	Original.	Increase.				
3,276	17	3,293	.....	605,382	9,267	2	9,738	3	3,449	1,756	454,509	689,597
788	23	811	.....	277,391	16	2	166	.....	1,009	968	105,044	279,553
4,064	40	4,104	.....	942,773	9,283	4	9,904	3	4,458	2,724	559,553	969,149
535	7	542	*1,896	142,592	4	2	168	1	794	678	66,637	144,179
126	3	129	.....	114,072	5	1	75	.....	177	106	14,793	†114,436
461	10	471	.....	256,604	9	3	183	1	971	784	81,430	258,615
1,715	30	1,745	.....	497,172	106	1	309	2	826	1,129	267,535	499,545
2,614	.....	2,614	.....	202,966	9,173	.....	9,487	.....	2,838	917	225,381	225,381
3,729	30	3,759	.....	700,138	9,279	1	9,796	2	3,664	2,046	492,916	724,926

Under the act of August 4, 1888, there were allowed 307 supplemental certificates.

* In addition to the above there were 4 widows, war of 1812, and 1 widow, Mexican war, restored during the year.

† This includes a large number of claims which have been found by actual count to be duplicates; also claims which were rejected, and after such action they were returned to the admitted files.

During the year there were 21 increase Mexican survivors allowed by special act.

TABLE NO. 13.—Comparative statement of pension claims of all classes

Year.	Claims admitted and rejected.	Army.						Navy.		
		Invalid.			Widows, etc.			Invalid.		
		Original.	Increase.	Total.	Original.	Increase.	Total.	Original.	Increase.	Total.
1881	Admitted	21, 143	12, 353	33, 496	3, 717	200	3, 917	251	154	405
1881	Rejected	2, 625	8, 875	11, 500	1, 137	80	1, 167	65	65	120
	Total	23, 768	21, 228	44, 996	4, 854	230	5, 084	306	219	525
1882	Admitted	22, 684	9, 435	32, 119	3, 910	48	3, 958	263	88	350
1882	Rejected	4, 030	15, 199	19, 229	1, 512	26	1, 538	128	149	277
	Total	26, 714	24, 634	51, 348	5, 422	74	5, 496	390	237	627
1883	Admitted	31, 801	22, 554	54, 355	5, 216	67	5, 283	213	112	325
1883	Rejected	10, 901	19, 978	30, 879	4, 512	28	4, 540	530	141	671
	Total	42, 702	42, 532	85, 234	9, 728	95	9, 823	743	253	996
1884	Admitted	27, 173	22, 190	49, 363	6, 260	56	6, 316	241	270	511
1884	Rejected	17, 587	19, 847	37, 434	4, 983	15	4, 998	347	189	536
	Total	44, 760	42, 037	86, 797	11, 243	71	11, 314	588	459	1, 047
1885	Admitted	27, 286	33, 618	60, 904	7, 632	144	7, 776	294	183	477
1885	Rejected	9, 028	19, 241	28, 269	3, 058	28	3, 086	189	89	278
	Total	36, 314	52, 859	89, 173	10, 690	172	10, 862	483	272	755
1886*	Admitted	31, 619	33, 008	64, 627	8, 501	65, 313	73, 814	318	271	589
1886	Rejected	15, 918	41, 056	57, 974	3, 728	50	3, 778	277	379	656
	Total	47, 537	74, 064	121, 601	12, 229	65, 363	77, 592	595	650	1, 245
1887	Admitted	34, 758	31, 791	66, 549	11, 034	83	11, 117	525	223	748
1887	Rejected	7, 657	32, 024	39, 681	3, 481	70	3, 551	321	247	568
	Total	42, 415	63, 815	106, 230	14, 515	153	14, 668	846	470	1, 316
1888	Admitted	35, 089	44, 785	79, 874	10, 611	341	10, 952	754	449	1, 203
1888	Rejected	32, 213	30, 739	62, 952	11, 060	50	11, 110	740	326	1, 066
	Total	67, 302	75, 524	142, 826	21, 671	391	22, 062	1, 494	775	2, 269
1889	Admitted	35, 699	70, 194	106, 193	11, 614	116	11, 730	831	744	1, 576
1889	Rejected	11, 122	37, 049	48, 171	5, 689	41	5, 730	1, 190	442	1, 632
	Total	46, 821	107, 243	154, 364	17, 303	157	17, 460	1, 991	1, 186	3, 177
1890	Admitted	49, 453	76, 511	125, 964	14, 225	120	14, 345	942	901	1, 843
1890	Rejected	8, 120	99, 013	107, 133	5, 791	50	5, 841	392	977	1, 369
	Total	57, 573	175, 524	233, 097	20, 014	170	20, 184	1, 334	1, 878	3, 212

* Under act of March 19, 1886, there were 79,989 widows' pensions increased (included in the above) for which no applications were required.

settled by allowance and rejection each year since 1881, except arrears.

Navy.			Army and Navy restorations.	Total Army and Navy.	War of 1812.				Mexican War (act of January 29, 1857).		Total number of original claims.	Aggregate of all classes.
Widows, etc.					Survivors.		Widows.		Survivors, original.	Widows, original.		
Original.	Increase.	Total.			Original.	Increase.	Original.	Increase.				
203 83	10	213 83	1,344 20	39,375 12,890	115 391	..... .....	1,965 1,005	..... .....	..... .....	..... .....	..... .....	41,455 19,886
286	10	296	1,364	52,265	506	.....	3,570	.....	.....	.....	.....	56,341
89 59	11	100 59	640	37,176 21,103	26 49	..... .....	693 143	..... .....	..... .....	..... .....	..... .....	37,896 21,295
148	11	159	949	53,279	75	.....	836	.....	.....	.....	.....	59,190
87 346	13	100 346	796	60,859 42,436	23 51	..... .....	822 200	..... .....	..... .....	..... .....	38,162 22,540	61,704 42,687
433	13	446	796	103,295	74	.....	1,022	.....	.....	.....	60,702	104,391
106 112	1 1	107 113	1,221	57,516 43,071	24 50	..... .....	384 262	..... .....	..... .....	..... .....	34,192 23,341	57,830 43,383
218	2	220	1,221	100,589	74	.....	689	.....	.....	.....	57,533	101,318
111 57	11	122 57	1,835	71,143 31,730	18 38	..... .....	426 167	..... .....	..... .....	..... .....	35,767 12,587	71,587 31,925
168	11	179	1,845	102,673	56	.....	593	.....	.....	.....	48,304	103,522
109 385	*1,260 2	1,369 387	2,229	142,648 62,595	5 22	3	305 113	*13,396 2	..... .....	..... .....	40,857 20,443	*156,357 62,732
494	1,282	1,776	2,229	205,243	27	3	418	13,398	.....	.....	61,800	219,089
183 91	8 1	191 92	2,707	81,312 43,892	8 18	2	231 59	..... .....	7,552 251	903 14	55,194 11,892	90,008 44,234
274	9	283	2,707	125,204	26	2	290	.....	7,803	917	67,086	134,242
205 253	11	216 245	2,928	92,245 75,363	2 11	..... .....	251 56	..... .....	0,048 2,062	4,292 588	60,252 46,905	105,838 78,080
440	11	451	2,928	167,608	13	.....	307	.....	11,110	4,880	107,227	185,918
280 241	11	291 341	1,754	119,819 55,844	8 10	8	181 268	7	1,772 348	1,206 209	51,921 19,147	123,001 56,679
621	11	632	1,754	175,663	18	8	449	7	2,120	1,415	71,068	179,680
335 126	7 3	342 129	1,896	142,592 114,072	4 5	2 1	108 75	1	794 177	678 106	66,637 14,793	144,179 114,436
461	10	471	.....	256,664	9	3	183	1	971	784	81,430	258,615

† This includes a large number of claims which have been found, by actual count, to have been thus disposed of.

TABLE NO. 14.—Report of certificates issued during the fiscal year ending June 30, 1890.

Months.	Original.										Restoration.	Re-issuance.	Increase.	Act of March 3, 1883.	Order of April 3, 1884.	Act of August 4, 1886.	Arrears Act of June 7, 1888.	Act of March 4, 1890.	Duplications.	Supplementals.	Accrued.	Arrears.	Total.
	Army.		Navy.		1812.		Old war widows.		Mexican war.														
	Invalids.	Widows, etc.	Invalids.	Widows, etc.	Survivors.	Widows.	Survivors.	Widows.	Survivors.	Widows.													
1880.	July	3,168	1,020	68	25	.....	12	1	87	51	3,274	1,049	98	4	5	3	22	.....	59	76	325	8	9,410
	August	3,432	707	57	26	.....	7	2	49	47	3,118	531	125	3	.....	6	20	.....	62	45	276	4	8,520
	September	4,184	848	67	14	.....	9	3	57	46	4,588	348	46	6	.....	1	16	.....	76	9	287	1	10,565
	October	3,088	871	53	23	.....	6	.....	27	49	4,056	1,400	131	1	.....	.....	32	.....	37	47	338	2	10,186
	November	3,876	942	87	21	.....	10	5	74	51	7,040	1,410	101	4	.....	.....	9	.....	90	71	305	.....	14,180
	December	3,493	834	69	18	.....	13	2	92	44	4,914	689	139	2	.....	.....	10	.....	26	9	284	2	10,640
1890.	January	4,007	1,290	66	23	.....	12	3	88	65	3,151	684	146	4	.....	.....	8	.....	82	3	338	4	9,985
	February	3,755	1,016	86	30	.....	9	6	81	59	7,181	626	185	10	.....	.....	8	.....	88	4	368	1	13,482
	March	5,982	1,865	119	40	.....	6	.....	70	89	6,464	902	237	6	.....	.....	14	.....	87	6	512	1	16,374
	April	5,020	1,544	101	41	.....	7	6	61	60	5,631	1,147	226	5	.....	.....	7	.....	126	95	13	4	14,562
	May	5,294	1,709	83	37	.....	9	5	49	50	5,412	1,099	194	4	.....	.....	3	.....	14	769	56	3	15,711
	June	4,141	1,832	81	28	.....	8	5	59	67	10,137	1,140	183	5	.....	.....	3	.....	.....	6	492	4	16,054
		49,453	16,277	942	325	4	108	46	794	678	64,966	11,535	1,801	64	8	13	163	994	577	295	4,478	37	151,058

TABLE NO. 15.—*Operations of the special examination service of the office, showing investigations made, etc., during the fiscal year ending June 30, 1890.*

	Number of investigations made, 1889.	Expenses in 1889.	Number of investigations made, 1890.	Expenses in 1890.
Number of cases returned by special examiners in the field.	38, 801	.....	32, 598	.....
Expenses of special examiners' subsistence		\$273, 447. 00		\$250, 578. 21
Expenses of special examiners' travel, etc. (including cost of travel over subsidized railroads)		138, 927. 32		138, 833. 69
Total	38, 801	412, 374. 32	32, 598	389, 411. 90

Statement showing a comparison of work performed by special examiners, with cost of same, during fiscal years ending June 30, 1889 and 1890.

	1889.	1890.
Average number of examiners per month	254	230
Number of reports made	38, 801	32, 598
Average number of reports per examiner per month	121	111
Number of depositions taken	177, 743	162, 875
Average number of depositions per examiner per month	594	581
Amount of expenses exclusive of salary	\$412, 374. 32	\$389, 411. 90
Average cost of each report	10. 62	11. 95
Average cost of each deposition	2. 32	2. 39

Work accomplished by review section, established July 20, 1889.

Reviewers employed, average number of	8
Number of days employed	2, 418
Number of cases submitted for admission	1, 673
Number of cases submitted for rejection	233
Number of cases submitted for further examination	22, 904
Number of cases otherwise disposed of	1, 242
Number of cases reviewed	26, 052
Number of circulars, calls, and letters to special examiners	1, 906
Number of cases in division July 1, 1889	15, 806
Number of cases received from July 1, 1889, to June 30, 1890	13, 932
	29, 738
Number of cases submitted to board of review	16, 048
Number of cases sent to admitted files	186
Number of cases sent to other divisions	2, 970
	19, 204
Total number of cases in division July 1, 1890	10, 534
Number of cases detailed to special examiners in field :	
Original examination	16, 250
Further examination	28, 705
Criminal examination	435
	45, 390
Number of reports made by special examiners upon cases returned from the field	43, 676

TABLE NO. 16.—*Detailed report of work completed in the Army and Navy Survivors' Division from July 1, 1889, to June 30, 1890, inclusive, showing number of names with post-office addresses supplied to the Adjudicating Divisions, the Special Examination Division, and to claimants or their attorneys.*

	Commis- sioned officers.	Non- commis- sioned officers.	Privatea.	Total of names.	Total of cases.	Special names.
Eastern Division.....	6,577	9,254	26,309	44,140	6,730	3,408
Middle Division.....	6,368	8,839	19,464	34,671	4,461	2,894
Western Division.....	4,766	5,076	15,290	25,132	3,141	2,417
Southern Division.....	4,111	4,415	16,229	24,755	3,393	1,390
Old War and Navy Division.....	4,114	3,551	13,288	20,953	3,009	3,699
Special Examination Division.....	2,777	3,114	8,669	14,560	1,948	1,400
Miscellaneous calls.....	33,257	28,278	64,430	125,965	25,707	29,112
Total.....	61,670	62,527	165,670	290,176	48,369	44,318

Total number of names with post-office addresses furnished in 48,369 cases.....	290,176
Addresses supplied to specified names.....	44,318
Circular lists of officers and comrades.....	25,707
Letters and circular letters.....	34,416
Circular cards, including prisoners of war and naval cards.....	47,900
Calls on Adjutant-General, U. S. Army.....	2,371
Calls on Surgeon-General, U. S. Army.....	615
Calls on Navy Department.....	533
Calls on Treasury Department.....	120
Post-office addresses of surgeons furnished during the year.....	3,393

TABLE NO. 17.—Report of the Mail Division for the fiscal year ending June 30, 1890.

	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Total.
RECEIVED.													
Original invalid cases*	6,392	6,456	6,043	5,441	4,925	6,061	6,136	6,712	7,872	7,966	7,472	6,044	78,440
Original widows' cases*	2,016	2,259	2,259	2,504	2,170	2,332	2,309	2,455	2,634	3,470	3,291	3,518	31,982
Original 1812 cases*	14	18	17	14	14	18	35	19	14	12	17	23	209
Original bounty-land cases*	45	44	35	20	29	35	36	19	37	42	34	34	499
Original Navy cases*	101	186	169	203	164	174	210	212	285	340	308	306	2,722
Original old war cases and Mexican service.	197	246	297	347	176	180	181	176	200	222	264	204	2,470
Applications for increase.	16,856	14,475	14,268	10,015	9,835	15,380	13,394	12,507	17,441	16,864	14,536	15,025	172,430
Communications from the Departments.	1,854	1,862	1,748	2,060	2,240	1,950	1,729	1,944	2,248	2,382	2,284	1,881	23,822
Pieces of additional evidence, A to G.	40,284	40,875	38,885	36,806	37,836	41,833	45,043	44,585	50,797	53,321	50,684	50,546	559,702
Pieces of additional evidence, O to Z.													
Fee agreements in duplicate.	7,067	7,049	7,250	7,513	7,880	6,489	6,708	6,674	9,945	11,916	11,927	11,341	103,068
Applications for transfer.	131	74	97	121	77	102	102	98	169	109	96	94	1,240
Applications for new certificate.	110	133	178	146	110	180	104	103	178	129	106	156	1,614
Reports from Adjutant-General.	10,068	20,734	12,452	12,673	14,223	12,830	13,395	18,044	20,166	16,555	16,905	12,447	107,422
Reports from Surgeon-General.	5,040	3,213	3,225	5,070	5,268	2,950	57	35	80	73	60	43	28,191
Miscellaneous letters (not inquiries) and A and N service cards.	32,430	31,183	26,155	25,908	26,829	38,950	32,207	34,415	40,022	37,387	41,820	42,579	469,028
Pension certificates returned by pension agents.	4,212	4,520	7,738	2,486	8,245	2,975	8,121	5,029	3,524	7,447	5,463	1,940	58,620
Surgeons' certificates.	19,551	16,842	15,208	12,711	16,367	16,686	10,707	14,415	20,766	23,716	36,907	40,181	244,159
Orders for medical examination returned.	17,349	17,308	12,089	12,450	15,666	15,092	12,601	13,169	18,584	23,251	32,048	30,859	227,206
Accounts from examining surgeons.	6,859	6,921	6,188	6,355	7,093	7,441	6,668	6,880	8,367	8,146	9,306	9,903	80,437
Accounts and cases from special examiners.	4,703	4,917	3,637	3,928	3,792	3,061	2,838	3,372	3,403	3,147	3,240	3,085	43,751
Reports from Pension agents.	1,163	1,039	3,129	2,561	2,102	1,148	2,119	1,195	3,142	3,142	3,135	3,131	1,767
Daily reports of special examiners.	6,893	7,598	7,037	6,091	8,370	8,005	7,433	6,411	6,839	6,681	6,385	6,385	87,020
Credibility of witnesses.	7,275	7,216	4,400	7,886	8,384	9,495	9,019	11,113	14,056	11,388	8,179	6,813	107,272
Number of dead letters returned by Post-Office Department.													
Certificates for release (act of March 3, 1883, and March 3, 1885).	2,458	2,422	2,879	2,729	2,780	3,315	3,400	4,142	4,403	3,479	3,901	4,214	40,280
Contractual communications.	6,549	7,705	7,468	9,148	10,462	19,359	20,440	17,745	17,579	11,489	11,859	12,110	151,950
Letters of inquiry.	81,228	84,022	70,367	78,777	70,123	72,309	84,196	71,993	70,367	74,678	76,287	68,481	916,825
Money received in mail.	\$1,730.43	\$422.10	\$346.72	\$653.00	\$2,361.00	\$3,944.44	\$1,013.00	\$968.20	\$1,242.60	\$3,020.20	\$2,742.80	\$1,034.84	\$17,642.19
Postage-stamps received in mail.	1,185	1,308	732	403	670	126	686	778	871	846	760	729	9,686
MISCELLANEOUS.													
Number of foreign letters sent (postage prepaid).	48	50	38	54	65	63	82	57	98	70	60	49	781
Total number of pieces received for the year.	201,470	296,500	292,891	333,972	263,466	280,372	280,079	292,249	326,262	326,919	344,707	324,094	3,582,350
Total number of pieces sent out for the year.	127,679	144,370	108,704	150,552	125,073	191,093	203,167	208,177	235,183	224,589	240,278	188,092	2,211,273
Calls on Adjutant-General sent.	12,953	10,258	8,444	12,169	16,330	12,038	11,803	17,377	19,394	17,563	16,670	11,568	164,585
Calls on Surgeon-General sent.	4,579	3,646	5,231	5,097	5,221	5,038	5,190	5,112	5,394	5,563	5,670	5,568	21,698

† Not included in letters sent.

• This includes duplicates.

TABLE NO. 18.—Showing the number of pensioners in each county of each State and Territory of the United States and in each foreign country on the rolls June 30, 1890.

County.	No.	County.	No.	County.	No.
<i>Alabama.</i>		<i>Arizona—Continued.</i>		<i>Arkansas—Continued.</i>	
Anteiga.....	10	Blairstown.....	11	Saline.....	23
Baldwin.....	9	Cibola.....	19	Scott.....	41
Barbour.....	8	Kidman.....	1	Searcy.....	23
Bibb.....	11	Maricopa.....	43	Sebastian.....	142
Blount.....	29	Mohave.....	6	Sawyer.....	22
Bullock.....	10	Navajo Indian Reservation.....	1	Sharp.....	23
Butler.....	10	Pinia.....	23	Stone.....	19
Calhoun.....	50	Pinal.....	10	Union.....	4
Chambers.....	9	Yavapai.....	62	Van Buren.....	25
Cherokee.....	24	Yuma.....	10	Washington.....	223
Chilton.....	8	Total.....	233	White.....	80
Choctaw.....	7			Woodruff.....	16
Clarke.....	10			Yell.....	148
Clay.....	27				
Cleburne.....	15	<i>Arkansas.</i>		<i>Total.....</i>	
Coffee.....	6	Arkansas.....	50		4,322
Colbert.....	25	Ashley.....	2	<i>California.</i>	
Conner.....	6	Baxter.....	31	Alameda.....	214
Cook.....	11	Benton.....	265	Alpine.....	6
Covington.....	7	Boone.....	112	Amador.....	22
Crenshaw.....	15	Bradley.....	6	Butte.....	124
Cullman.....	60	Calhoun.....	4	Calaveras.....	79
Dale.....	21	Carroll.....	218	Catalina Island.....	1
Dallas.....	17	Chicot.....	3	Colusa.....	61
De Kalb.....	102	Clark.....	60	Contra Costa.....	92
Elmore.....	13	Clay.....	60	Del Norte.....	15
Escambia.....	9	Cleburne.....	23	El Dorado.....	57
Etowah.....	24	Cleveland.....	11	Fresno.....	104
Fayette.....	19	Columbia.....	25	Humboldt.....	106
Franklin.....	8	Conway.....	69	Inyo.....	18
Geneva.....	4	Craighead.....	27	Kern.....	62
Greene.....	11	Crawford.....	42	Lake.....	41
Hale.....	7	Crittendon.....	11	Lassen.....	16
Henry.....	28	Cross.....	7	Los Angeles.....	934
Jackson.....	79	Dallas.....	13	Marin.....	14
Jefferson.....	98	DeSoto.....	13	Mariposa.....	28
Lamar.....	18	Drew.....	8	Mendocino.....	78
Lauderdale.....	32	Franklin.....	28	Merced.....	28
Lawrence.....	48	Fulton.....	124	Modoc.....	84
Lee.....	13	Garland.....	62	Mono.....	11
Limestone.....	60	Grant.....	102	Monterey.....	74
Lowndes.....	5	Greene.....	9	Napa.....	126
Madison.....	11	Hamstead.....	54	Nevada.....	94
Macon.....	99	Hot Spring.....	14	Orange.....	80
Madison.....	3	Howard.....	42	Placer.....	81
Marion.....	3	Independence.....	26	Plumas.....	16
Marietta.....	26	Iowa.....	86	Sacramento.....	192
Mobile.....	83	Jackson.....	48	San Benito.....	25
Monroe.....	13	Jefferson.....	37	San Bernardino.....	191
Montgomery.....	105	Johnson.....	63	San Diego.....	358
Morgan.....	86	La Fayette.....	65	San Francisco.....	1,513
Perry.....	9	Lawrence.....	4	San Joaquin.....	133
Pickens.....	20	Lee.....	52	San Luis Obispo.....	93
Pike.....	20	Lincoln.....	25	San Mateo.....	3
Randolph.....	23	Little River.....	10	Santa Barbara.....	108
Russell.....	4	Logan.....	15	Santa Clara.....	277
Saint Clair.....	27	Louise.....	128	Santa Cruz.....	119
Shelby.....	26	Madison.....	58	Shasta.....	92
Sumpter.....	11	Martins.....	189	Sierra.....	16
Talladega.....	28	Miller.....	41	Siskiyou.....	44
Tallahassee.....	15	Mississippi.....	25	Solano.....	118
Tuscaloosa.....	24	Monroe.....	13	Sonoma.....	151
Walker.....	34	Montgomery.....	12	Stanislaus.....	46
Washington.....	6	Nevada.....	52	Sutter.....	20
Wilcox.....	12	Newton.....	22	Tehama.....	64
Winston.....	24	Onachita.....	74	Trinity.....	11
Total.....	1,645	Perry.....	17	Tulare.....	147
<i>Alaska.</i>		Phillips.....	92	Tuolumne.....	30
The Territory.....	9	Pike.....	53	Ventura.....	67
Total.....	9	Poinsett.....	26	Yolo.....	60
<i>Arizona Territory.</i>		Polk.....	12	Yuba.....	46
Apache.....	15	Pope.....	34		
Cochise.....	22	Prairie.....	72	<i>Total.....</i>	
		Pulaski.....	30		6,542
		Randolph.....	170	<i>Colorado.</i>	
		St. Francis.....	65	Arapahoe.....	836
			14	Archuleta.....	7

TABLE No. 18.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>Colorado—Continued.</i>		<i>District of Columbia.</i>		<i>Georgia—Continued.</i>	
Baca.....	28	Washington.....	4,548	Clinch.....	2
Bent.....	24			Cobb.....	22
Boulder.....	107	Total.....	4,548	Coffee.....	2
Chaffee.....	61			Colquitt.....	1
Cheyenne.....	1	<i>Florida.</i>		Columbia.....	10
Clear Creek.....	47	Alachua.....	59	Coweta.....	10
Conejos.....	29	Baker.....	3	Crawford.....	4
Costilla.....	7	Bradford.....	17	Dade.....	13
Custer.....	47	Brevard.....	19	Dawson.....	20
Delta.....	28	Brevard.....	8	Decatur.....	4
Dolores.....	6	Calhoun.....	18	De Kalb.....	19
Douglas.....	19	Citrus.....	7	Dodge.....	5
Eagle.....	13	Clay.....	24	Dooly.....	6
Elbert.....	14	Columbia.....	6	Dougherty.....	1
El Paso.....	152	Dade.....	3	Douglas.....	10
Fremont.....	57	De Soto.....	21	Early.....	5
Garfield.....	53	Duval.....	80	Echols.....	1
Gilpin.....	10	Escambia.....	30	Elbert.....	2
Grand.....	6	Franklin.....	8	Emanuel.....	1
Gunnison.....	31	Gadsden.....	5	Fannin.....	54
Haralson.....	1	Hamilton.....	5	Fayette.....	4
Hinsdale.....	6	Hernando.....	12	Floyd.....	24
Huerfano.....	23	Hillborough.....	67	Forayth.....	5
Jefferson.....	38	Holmes.....	4	Franklin.....	2
Kiowa.....	16	Jackson.....	11	Fulton.....	136
Kit Carson.....	21	Jefferson.....	8	Gilmer.....	37
Lake.....	71	Lake.....	28	Glascock.....	1
La Platte.....	81	La Fayette.....	13	Glynn.....	12
Larimer.....	78	Lee.....	8	Gordon.....	37
Las Animas.....	102	Leon.....	9	Greene.....	11
Lincoln.....	6	Levy.....	12	Gwinnett.....	11
Logan.....	43	Liberty.....	2	Habersham.....	21
Mesa.....	37	Madison.....	12	Hall.....	16
Montezuma.....	14	Manatee.....	16	Hancock.....	3
Montrose.....	42	Marion.....	76	Haralson.....	21
Morgan.....	6	Monroe.....	21	Harris.....	5
Otero.....	22	Nassau.....	20	Hart.....	6
Ouray.....	30	Orange.....	9	Heard.....	3
Park.....	21	Osceola.....	65	Henry.....	11
Phillips.....	21	Pasco.....	14	Houston.....	4
Pitkin.....	31	Polk.....	32	Jackson.....	5
Prowers.....	34	Putnam.....	61	Jasper.....	8
Pueblo.....	176	St. John's.....	45	Jefferson.....	2
Rio Blanco.....	8	Santa Rosa.....	13	Johnson.....	2
Rio Grande.....	27	Sumpter.....	10	Laurens.....	8
Routt.....	16	Swansee.....	15	Liberty.....	3
Saguache.....	30	Taylor.....	10	Lincoln.....	2
San Juan.....	14	Volusia.....	57	Lowndes.....	6
San Miguel.....	9	Wakulla.....	3	Lumpkin.....	21
Sedgwick.....	8	Walton.....	16	McDuffie.....	2
Summit.....	17	Washington.....	26	McIntosh.....	1
Weld.....	84			Macon.....	3
Washington.....	38	Total.....	1,044	Madison.....	3
Yuma.....	31			Marion.....	3
Total.....	2,745	<i>Georgia.</i>		Meriwether.....	6
<i>Connecticut.</i>		Appling.....	3	Miller.....	2
Fairfield.....	1,513	Baker.....	1	Milton.....	3
Hartford.....	1,131	Baldwin.....	3	Mitchell.....	3
Litchfield.....	610	Banks.....	1	Monroe.....	10
Middlesex.....	301	Barrow.....	28	Montgomery.....	9
New Haven.....	1,482	Berrien.....	4	Morgan.....	5
New London.....	939	Bibb.....	28	Murray.....	22
Tolland.....	261	Brooks.....	1	Muscogee.....	19
Windham.....	570	Bryan.....	1	Newton.....	13
Total.....	6,807	Bulloch.....	2	Oconee.....	2
<i>Delaware.</i>		Burke.....	1	Oglethorpe.....	1
Kent.....	242	Butts.....	2	Paulding.....	1
New Castle.....	568	Calhoun.....	5	Pickens.....	30
Sussex.....	277	Camden.....	3	Pierce.....	2
Total.....	1,107	Campbell.....	6	Pike.....	6
		Carroll.....	26	Polk.....	11
		Catoosa.....	8	Pulaski.....	3
		Chatam.....	68	Putnam.....	5
		Chattahoochee.....	6	Rabun.....	5
		Chattanooga.....	15	Randolph.....	3
		Cherokee.....	22	Richmond.....	27
		Clarke.....	7	Rockdale.....	4
		Clay.....	5	Schley.....	1
		Clayton.....	7	Screven.....	6

TABLE NO. 18.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>Indiana—Continued.</i>		<i>Iowa—Continued.</i>		<i>Kansas—Continued.</i>	
Tippecanoe	941	Floyd	169	Butler	427
Tipton	433	Franklin	127	Chase	143
Union	111	Freemont	238	Chautauque	286
Vanderburg	557	Greene	192	Cherokee	396
Vermillion	324	Grundy	54	Cheyenne	42
Vigo	1,183	Guthrie	235	Clark	66
Wabash	499	Hamilton	150	Clay	229
Warren	253	Hancock	54	Clond	330
Warrick	440	Hardin	286	Coffey	319
Washington	534	Harrison	309	Comanche	36
Wayne	683	Henry	344	Cowley	603
Wells	315	Howard	164	Crawford	412
White	400	Humboldt	95	Davis	3
Whitley	271	Ida	59	Decatur	123
Total	47,798	Iowa	194	Dickinson	286
<i>Indian Territory.</i>		Jackson	315	Doniphan	224
Cherokee Nation	292	Jasper	450	Douglas	396
Cherokee Outlet	6	Jefferson	332	Edwards	78
Cheyenne and Arapahoe Nation	3	Johnson	207	Elk	276
Chickasaw Nation	131	Jones	296	Ellis	84
Choctaw Nation	92	Kekukuk	439	Ellsworth	143
Creek Nation	70	Kossuth	120	Finney	90
Kansas Nation	1	Lee	616	Ford	168
Kiowa and Comanche Nation	1	Lin	622	Franklin	318
Orange Nation	7	Louis	299	Garfield	18
Otoe and Missouri Nation	2	Lucas	284	Geary	118
Pawnee Nation	3	Ly	60	Gove	55
Ponca Nation	4	Madison	260	Graham	72
Pottawatomie Nation	4	Mahaska	407	Grant	38
Public Land Strip	18	Marion	475	Gray	50
Sac and Fox Nation	1	Marshall	417	Greeley	37
Seminole Nation	37	Mills	142	Greenwood	302
Wyandotte Nation	2	Mitchell	139	Hamilton	49
Total	574	Monona	130	Harper	177
<i>Iowa.</i>		Montee	215	Harvey	291
Adair	147	Montgomery	219	Haskell	34
Adams	218	Muscataine	315	Hodgeman	54
Allamakee	177	O'Brien	144	Jackson	181
Appanoose	425	Oceola	92	Jefferson	211
Audubon	108	Page	315	Jewel	274
Benton	282	Pala Alto	88	Johnson	244
Black Hawk	259	Lymouth	110	Kearney	23
Boone	256	Pocahontas	75	Kingman	164
Bremer	171	Polk	775	Kiowa	54
Buchanan	89	Pottawattamie	354	Labette	583
Buena Vista	110	Poweshick	242	Lane	34
Butler	203	Ringgold	270	Leavenworth	1,132
Calhoun	127	Sac	120	Lincoln	127
Carroll	138	Scott	245	Lin	304
Cass	237	Shelby	123	Logan	60
Cedar	131	Sioux	108	Lyon	346
Cerro Gordo	199	Story	244	McPherson	225
Cherokee	113	Tama	201	Marion	184
Chickasaw	129	Taylor	288	Marshall	260
Clarke	236	Union	235	Meade	60
Clay	76	Van Buren	428	Miami	241
Clayton	276	Wapello	590	Mitchell	274
Clinton	264	Warren	272	Montgomery	684
Crawford	86	Washington	324	Morris	207
Dallas	281	Wayne	373	Morton	31
Davis	245	Webster	192	Nemaha	282
Decatur	387	Winnebago	57	Neosho	299
Delaware	178	Winnechick	218	Ness	81
Des Moines	339	Woodbury	315	Norton	165
Dickinson	62	Worth	47	Osage	312
Dubuque	271	Wright	130	Osborne	246
Emmet	37	Total	23,189	Ottawa	197
Fayette	308	<i>Kansas.</i>		Pawnee	154
		Allen	252	Phillips	210
		Anderson	337	Pottawattamie	252
		Atchison	256	Pratt	135
		Barber	123	Rawlins	82
		Barton	100	Reno	458
		Bourbon	413	Republic	204
		Brown	230	Rice	289
				Riley	234
				Rooks	150
				Rush	81

TABLE NO. 18.—*Showing the number of pensioners in each State and Territory and in each foreign country—Continued.*

County.	No.	County.	No.	County.	No.
<i>Kansas—Continued.</i>		<i>Kentucky—Continued.</i>		<i>Louisiana—Continued.</i>	
Russell.....	163	Henderson.....	111	Avoyelles.....	3
St. John.....	3	Henry.....	111	Bossier.....	3
Saline.....	189	Hickman.....	23	Calcasieu.....	19
Scott.....	32	Hopkins.....	111	Caldwell.....	50
Sedgwick.....	554	Jackson.....	166	Cameron.....	3
Seward.....	33	Jefferson.....	1,399	Catahoula.....	23
Shawnee.....	909	Jessamine.....	38	Chalburpe.....	19
Sheridan.....	31	Johnson.....	106	Concordia.....	19
Sherman.....	73	Kenton.....	329	De Soto.....	13
Smith.....	192	Kimball.....	5	East Baton Rouge.....	85
Stafford.....	149	Knott.....	127	East Carroll.....	29
Stanton.....	16	La Rue.....	128	East Feliciana.....	34
Stevens.....	19	Laurel.....	175	Franklin.....	4
Sumner.....	431	Lawrence.....	212	Grant.....	9
Thomas.....	65	Lee.....	71	Iberia.....	12
Trego.....	59	Leslie.....	32	Iberville.....	28
Wabashess.....	118	Letcher.....	14	Jackson.....	22
Wallace.....	36	Lewis.....	276	Jefferson.....	22
Washington.....	296	Lincoln.....	79	La Fayette.....	5
Wichita.....	46	Livingstone.....	51	La Fourche.....	17
Wilson.....	329	Logan.....	82	Licola.....	4
Woodson.....	172	Lyon.....	74	Livingston.....	24
Wyandotte.....	498	McCracken.....	186	Madison.....	11
Total.....	22,321	Magoffin.....	79	Morehouse.....	4
<i>Kentucky.</i>		Marion.....	194	Natchitoches.....	18
Adair.....	332	Marshall.....	49	Orleans.....	687
Allen.....	194	Martin.....	70	Ouachita.....	8
Anderson.....	83	Mason.....	197	Plaquemine.....	5
Ballard.....	17	Mendo.....	61	Pontre Coupee.....	6
Barren.....	173	Mentifos.....	24	Rapides.....	39
Bath.....	77	Merces.....	143	Red River.....	7
Bed.....	65	Metcalfe.....	191	Richland.....	3
Boone.....	50	Monroe.....	304	Sabine.....	16
Bourbon.....	62	Montgomery.....	101	St. Helena.....	18
Boyd.....	194	Morgan.....	32	St. James.....	8
Boyle.....	113	Muhlenberg.....	246	St. John Baptist.....	3
Bracken.....	90	Nelson.....	101	St. Landry.....	14
Breathitt.....	53	Nicholas.....	93	St. Martin.....	4
Breckinridge.....	174	Ohio.....	292	St. Mary's.....	19
Bullitt.....	35	Oldham.....	34	St. Tammany.....	22
Butler.....	209	Owen.....	76	Tangipahoa.....	30
Caldwell.....	64	Owsley.....	142	Tensas.....	26
Calloway.....	40	Pendleton.....	189	Terre Bonne.....	4
Campbell.....	338	Perry.....	44	Union.....	3
Carlisle.....	20	Pike.....	109	Vermillion.....	3
Carroll.....	86	Powell.....	36	Vernon.....	4
Carters.....	226	Pulaski.....	281	Washington.....	18
Cass.....	207	Robertson.....	29	West Baton Rouge.....	9
Christian.....	129	Rockcastle.....	117	West Carroll.....	3
Clark.....	78	Rowan.....	51	West Feliciana.....	5
Clay.....	213	Russell.....	162	Winn.....	22
Clinton.....	163	Scott.....	48	Total.....	1,516
Crittenden.....	121	Shelby.....	74	<i>Maine.</i>	
Cumberland.....	197	Simpson.....	52	Androscoggin.....	875
Daviess.....	211	Spencer.....	29	Arroostook.....	769
Edmonson.....	117	Taylor.....	197	Cumberland.....	1,282
Elliot.....	29	Todd.....	81	Franklin.....	328
Estill.....	166	Trigg.....	34	Hancock.....	771
Fayette.....	161	Trimble.....	34	Kennebec.....	2,438
Fleming.....	168	Union.....	54	Knox.....	838
Floyd.....	38	Warren.....	326	Lincoln.....	363
Franklin.....	144	Washington.....	177	Oxford.....	870
Fulton.....	22	Wayne.....	124	Pembscot.....	2,261
Gallatin.....	57	Webster.....	63	Piscataquis.....	444
Garrard.....	85	Whitley.....	138	Sagadahoc.....	376
Grant.....	114	Wolfe.....	49	Somerset.....	818
Graves.....	37	Woodford.....	51	Waldo.....	1,184
Grayson.....	293	Total.....	15,909	Washington.....	1,078
Greene.....	245	<i>Louisiana.</i>		York.....	789
Gresham.....	145	Acadia.....	21	Total.....	15,924
Hancock.....	68	Assension.....	28		
Hardin.....	221	Assumption.....	9		
Harrison.....	49				
Hartson.....	111				
Hart.....	207				

TABLE NO. 18.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>Maryland.</i>		<i>Michigan—Continued.</i>		<i>Minnesota—Continued.</i>	
Alleghany.....	220	Ionia.....	845	Freeborn.....	185
Anne Arundel.....	103	Isco.....	74	Goodhue.....	148
Baltimore.....	2,726	Iron.....	16	Grant.....	80
Calvert.....	14	Isabella.....	278	Hennepin.....	1,203
Caroline.....	86	Jackson.....	865	Houston.....	95
Carroll.....	179	Kalamazoo.....	529	Hubbard.....	29
Cecil.....	251	Kalamazoo.....	126	Isanti.....	22
Charles.....	34	Kalamazoo.....	1,200	Itasca.....	10
Dorchester.....	108	Kalamazoo.....	9	Jackson.....	49
Frederick.....	228	Kalamazoo.....	94	Kanabon.....	12
Garrett.....	86	Kalamazoo.....	419	Kandiyohi.....	61
Harford.....	138	Kalamazoo.....	70	Kittson.....	7
Howard.....	43	Kalamazoo.....	851	Lac-qui-parle.....	32
Kent.....	82	Kalamazoo.....	373	Lake.....	26
Montgomery.....	62	Kalamazoo.....	3	Le Sueur.....	244
Prince George's.....	71	Kalamazoo.....	27	Lincoln.....	53
Queen Anne's.....	83	Kalamazoo.....	373	Lyons.....	146
St. Mary's.....	45	Kalamazoo.....	107	McLeod.....	165
Somerset.....	55	Kalamazoo.....	5	Marshall.....	27
Talbot.....	97	Kalamazoo.....	63	Martin.....	84
Washington.....	261	Kalamazoo.....	178	Meeker.....	129
Wicomico.....	82	Kalamazoo.....	206	Millie Lacs.....	63
Worcester.....	95	Kalamazoo.....	60	Morrison.....	79
Total.....	5,159	Kalamazoo.....	142	Mower.....	201
<i>Massachusetts.</i>		Kalamazoo.....	28	Murray.....	38
Barnstable.....	309	Kalamazoo.....	529	Nicollet.....	77
Berkshire.....	729	Kalamazoo.....	587	Nobles.....	69
Bristol.....	1,409	Kalamazoo.....	20	Norman.....	20
Dukes.....	39	Kalamazoo.....	347	Olmsted.....	206
Essex.....	3,578	Kalamazoo.....	248	Otter Tail.....	194
Franklin.....	552	Kalamazoo.....	581	Pine.....	25
Hampden.....	833	Kalamazoo.....	240	Pipestone.....	86
Hampshire.....	521	Kalamazoo.....	57	Polk.....	70
Middlesex.....	3,913	Kalamazoo.....	8	Popo.....	73
Nantucket.....	69	Kalamazoo.....	214	Ramsey.....	726
Norfolk.....	1,162	Kalamazoo.....	29	Rodwood.....	60
Plymouth.....	1,454	Kalamazoo.....	41	Renville.....	81
Suffolk.....	3,863	Kalamazoo.....	293	Rice.....	227
Worcester.....	3,406	Kalamazoo.....	13	Rock.....	58
Total.....	21,897	Kalamazoo.....	24	St. Louis.....	65
<i>Michigan.</i>		Kalamazoo.....	710	Scott.....	137
Alcona.....	17	Kalamazoo.....	465	Sherburne.....	50
Alger.....	23	Kalamazoo.....	524	Sibley.....	133
Allegan.....	561	Kalamazoo.....	162	Stearns.....	177
Alpena.....	65	Kalamazoo.....	34	Steele.....	136
Antrim.....	130	Kalamazoo.....	553	Stevens.....	48
Arenac.....	45	Kalamazoo.....	450	Swift.....	51
Baraga.....	6	Kalamazoo.....	793	Todd.....	83
Barry.....	512	Kalamazoo.....	594	Traverse.....	26
Bay.....	241	Kalamazoo.....	2,207	Wabasha.....	199
Benzie.....	64	Kalamazoo.....	201	Wadena.....	92
Berrien.....	1,006	Kalamazoo.....	26,853	Waseca.....	39
Branch.....	758	Kalamazoo.....	32	Washington.....	136
Calhoun.....	1,080	Kalamazoo.....	163	Watsonwan.....	38
Cass.....	405	Kalamazoo.....	72	Wilkin.....	20
Charlevoix.....	122	Kalamazoo.....	9	Winona.....	239
Cheboygan.....	130	Kalamazoo.....	53	Wright.....	190
Chippewa.....	30	Kalamazoo.....	73	Yellow Medicine.....	53
Clare.....	117	Kalamazoo.....	300	Total.....	9,269
Clinton.....	577	Kalamazoo.....	105	<i>Mississippi.</i>	
Crawford.....	51	Kalamazoo.....	23	Adams.....	144
Delta.....	27	Kalamazoo.....	163	Alcorn.....	14
Eaton.....	791	Kalamazoo.....	15	Amite.....	12
Emmett.....	185	Kalamazoo.....	41	Attala.....	16
Genesee.....	798	Kalamazoo.....	90	Benton.....	6
Gladwin.....	17	Kalamazoo.....	51	Bolivar.....	14
Grand Traverse.....	178	Kalamazoo.....	16	Calhoun.....	12
Gratiot.....	643	Kalamazoo.....	54	Carroll.....	16
Hillsdale.....	711	Kalamazoo.....	55	Chickasaw.....	10
Houghton.....	26	Kalamazoo.....	95	Choctaw.....	7
Huron.....	135	Kalamazoo.....	134	Claborne.....	16
Ingham.....	788	Kalamazoo.....	101	Clark.....	13
		Kalamazoo.....	232	Clay.....	13
		Kalamazoo.....	308	Concho.....	16
		Kalamazoo.....		Copiah.....	33

TABLE NO. 12.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>Mississippi—Continued.</i>		<i>Missouri—Continued.</i>		<i>Missouri—Continued.</i>	
Cornington	6	Carroll	286	St. Genevieve	21
De Soto	24	Carter	31	St. Louis	2019
Franklin	9	Cass	270	Saline	100
Greene	1	Cedar	169	Schuyler	221
Grenada	11	Chariton	227	Scotland	171
Hancock	13	Christian	172	Scott	90
Harrison	21	Clark	199	Shannon	79
Hinds	45	Clay	114	Shelby	194
Holmes	11	Clinton	137	Stoddard	150
Issaquena	9	Cole	113	Stone	79
Iawamba	11	Cooper	120	Sullivan	423
Jackson	10	Crawford	121	Taney	80
Jasper	5	Dade	178	Texas	229
Jefferson	86	Dallas	211	Vernon	294
Jones	12	Davies	234	Warren	50
Kemper	9	De Kalb	137	Washington	197
La Fayette	36	Dent	131	Wayne	123
Lauderdale	26	Douglas	117	Webster	728
Lawrence	5	Dunklin	62	Worth	132
Leake	6	Franklin	220	Wright	234
Lee	10	Gasconade	61		
Le More	7	Gentry	276	Total	23,740
Lincoln	16	Greene	462		
Lowndes	5	Grundy	307	<i>Montana.</i>	
Madison	24	Harrison	367	Beaver Head	13
Marion	12	Henry	227	Cascade	10
Marshall	17	Hickory	121	Choteau	17
Monroe	18	Holt	224	Custer	84
Montgomery	12	Howard	93	Dawson	18
Neahoba	8	Howell	232	Deer Lodge	49
Newton	7	Iron	95	Fergus	13
Noxubee	4	Jackson	1,073	Gallatin	44
Oktibbeha	11	Jasper	668	Jefferson	25
Panola	15	Jefferson	154	Lewis and Clarke	84
Perry	8	Johnson	241	Madison	34
Pike	48	Knos	148	Margher	20
Pontotoc	10	Laclede	232	Missoula	57
Prentiss	8	La Fayette	135	Park	42
Quitman	2	Lawrence	201	Silver Bow	71
Rankin	12	Leola	170	Yellowstone	27
Scott	9	Lincoln	61		
Sharkey	15	Linn	414	Total	602
Simpson	4	Livingston	280	<i>Nebraska.</i>	
Son Flower	2	McDonald	145	Adams	209
Tallahatchie	16	Macon	493	Antelope	134
Tate	15	Madison	72	Banner	19
Tippah	15	Marion	87	Blaine	32
Tudomingo	15	Marion	291	Boone	96
Union	7	Mercer	267	Box Butte	59
Warren	143	Miller	162	Brown	25
Washington	39	Mississippi	37	Buffalo	227
Wayne	1	Monteau	117	Burt	109
Webster	11	Monroe	98	Butler	140
Wilkinson	41	Montgomery	134	Cass	191
Winston	17	Morgan	94	Cedar	47
Yalobusha	11	New Madrid	20	Chase	56
Yazoo	14	Newton	217	Cherry	96
		Nodaway	398	Ciappeno	97
Total	1,286	Oregon	80	Clay	195
<i>Missouri.</i>		Osaage	92	Colfax	63
Adair	376	Ozark	93	Cuming	45
Andrew	180	Pemiscot	24	Custer	294
Atchison	133	Perry	92	Dakota	67
Atchison	104	Pettis	235	Dawes	110
Barry	216	Phelps	135	Dawson	136
Barton	220	Pike	212	Deuel	19
Bates	324	Platte	86	Dixon	85
Benton	149	Polk	262	Dodge	140
Bellinger	126	Pulaski	193	Douglas	621
Boone	145	Putnam	394	Dundy	86
Braham	418	Ralls	72	Fillmore	175
Butler	87	Randolph	201	Franklin	123
Caldwell	236	Ray	189	Frontier	79
Callaway	85	Reynolds	10	Furnas	184
Camden	135	Ripley	70		
Cape Girardeau	303	St. Charles	76		
		St. Clair	177		
		St. Francois	126		

TABLE NO. 18.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>Nebraska—Continued.</i>		<i>New Hampshire.</i>		<i>New York—Continued.</i>	
Gage	269	Belknap	493	Genesee	435
Garfield	19	Carroll	396	Greene	267
Gosper	30	Cheshire	566	Hamilton	141
Grant	6	Coco	376	Herkimer	773
Greeley	41	Grafton	876	Jefferson	1,290
Hall	162	Hillsborough	1,489	Kings	3,391
Hamilton	114	Merrimack	975	Lewis	305
Harlan	108	Rockingham	902	Livingston	568
Hayes	40	Stafford	587	Madison	713
Hitchcock	83	Sullivan	435	Monroe	1,414
Holt	220	Total	7,035	Montgomery	549
Howard	61	<i>New Jersey.</i>		New York	4,736
Jefferson	144	Atlantic	233	Niagara	641
Johnson	136	Bergen	127	Oneida	1,554
Kearney	87	Burlington	718	Onondaga	1,507
Keith	40	Camden	784	Ontario	584
Keya Paha	51	Cape May	123	Orange	961
Kimball	7	Cumberland	524	Orleans	367
Knox	92	Essex	1,433	Oswego	1,380
Lancaster	460	Gloucester	324	Otsego	754
Lincoln	110	Hudson	942	Putnam	58
Logan	15	Hunterdon	321	Queens	541
Loup	36	Mercer	845	Rensselaer	963
McPherson	1	Middlesex	393	Richmond	323
Madison	112	Monmouth	675	Rockland	136
Merrick	141	Morris	338	St. Lawrence	1,106
Nance	44	Ocean	260	Saratoga	795
Nemaha	142	Passaic	491	Schenectady	238
Nuckolls	111	Salem	271	Schoharie	295
Otoe	145	Somerset	175	Schuyler	318
Pawnee	128	Sussex	197	Seneca	378
Perkins	45	Union	427	Stenben	1,939
Phelps	62	Warren	293	Suffolk	370
Pierce	51	Total	9,894	Sullivan	577
Platte	101	<i>New Mexico Territory.</i>		Tioga	658
Polk	81	Bernalillo	45	Tompkins	541
Red Willow	160	Colfax	34	Ulster	802
Richardson	223	Dona Ana	20	Warren	576
Rock	82	Grant	84	Washington	669
Saline	252	Lincoln	29	Wayne	704
Sarky	39	Mora	15	Westchester	678
Saunders	153	Rio Arriba	2	Wyoming	468
Scott's Bluff	17	San Juan	12	Yates	301
Seward	168	San Miguel	51	Total	50,206
Sheridan	97	Santa Fé	62	<i>North Carolina.</i>	
Sherman	71	Sierra	25	Alamance	14
Sioux	15	Socorro	34	Alexander	4
Stanton	21	Taos	10	Alleghany	2
Thayer	168	Valencia	8	Anson	8
Thomas	13	Total	381	Ashe	26
Thurston	8	<i>New York.</i>		Beaufort	53
Valley	115	Albany	1,028	Bertie	83
Washington	110	Allegany	899	Bladen	9
Wayne	37	Broome	956	Brunswick	5
Webster	174	Cattaraugus	1,094	Buncombe	80
Wheeler	30	Cayuga	935	Burke	16
York	209	Chautauqua	1,141	Cabarrus	18
Total	9,531	Chemung	759	Caldwell	6
<i>Nevada.</i>		Chenango	796	Camden	17
Douglas	2	Clinton	744	Carteret	41
Elko	12	Columbia	371	Caswell	17
Emeralda	9	Corland	441	Catawba	14
Eureka	4	Delaware	635	Chatham	7
Humboldt	15	Dutchess	870	Cherokee	63
Lander	5	Eric	1,785	Chowan	6
Lincoln	5	Franklin	768	Clay	14
Lyon	9	Fulton	622	Cleveland	8
Nye	1	<i>New York.</i>		Columbus	8
Ormsby	24	Albany	1,028	Craven	150
Storey	17	Allegany	899	Cumberland	24
Washoe	32	Broome	956	Currituck	14
White Pine	5	Cattaraugus	1,094	Dare	28
Total	140	Cayuga	935	Davidson	9
		Chautauqua	1,141	Davis	3
		Chemung	759	Duplin	10
		Chenango	796	Durham	8
		Clinton	744		
		Columbia	371		
		Corland	441		
		Delaware	635		
		Dutchess	870		
		Eric	1,785		
		Franklin	768		
		Fulton	622		

TABLE NO. 18.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>North Carolina—Cont'd.</i>		<i>North Dakota—Cont'd.</i>		<i>Ohio—Continued.</i>	
Edgecombe.....	14	Eddy.....	22	Lake.....	314
Forsyth.....	17	Emmons.....	22	Lawrence.....	342
Franklin.....	5	Foster.....	26	Licking.....	749
Gaston.....	4	Garfield.....	14	Logan.....	487
Gates.....	8	Grand Forks.....	96	Lorain.....	453
Graham.....	8	Griggs.....	15	Lucas.....	280
Graustille.....	0	Kalder.....	26	Madison.....	340
Greene.....	4	La Moure.....	22	Mahoning.....	526
Gulford.....	19	Logan.....	11	Marion.....	120
Halifax.....	0	McHenry.....	21	Medina.....	228
Harnett.....	7	McIntosh.....	14	Meigs.....	262
Haywood.....	8	McLean.....	20	Mercer.....	222
Henderson.....	23	Mercer.....	17	Miami.....	682
Hertford.....	17	Morton.....	32	Monroe.....	569
Hyde.....	0	Nelson.....	42	Montgomery.....	1,243
Iredell.....	11	Oliver.....	14	Morgan.....	473
Jackson.....	9	Pembina.....	28	Morrow.....	415
Johnson.....	13	Ramsey.....	41	Muskegon.....	1,119
Jones.....	5	Ransom.....	32	Noble.....	408
Lenoir.....	11	Richland.....	55	Ottawa.....	241
Lenoir.....	11	Robette.....	26	Paulding.....	554
McDowell.....	17	Sargent.....	24	Perry.....	567
Macon.....	20	Stanton.....	3	Pickaway.....	299
Madison.....	70	Stark.....	17	Pike.....	424
Martin.....	12	Steele.....	30	Portage.....	358
Mecklenburgh.....	25	Stevens.....	5	Preble.....	544
Mitchell.....	124	Stoutman.....	28	Putnam.....	429
Montgomery.....	3	Towner.....	8	Richland.....	645
Moore.....	0	Trull.....	15	Ross.....	817
Naah.....	8	Walsh.....	41	Sandusky.....	406
New Hanover.....	30	Ward.....	8	Seneca.....	729
Northampton.....	12	Wells.....	7	Seneca.....	805
Onslow.....	0			Shelby.....	247
Orange.....	19	Total.....	1,234	Stark.....	882
Pamlico.....	17	<i>Ohio.</i>		Summit.....	754
Pasquotank.....	30	Adams.....	847	Trembly.....	404
Perquimans.....	34	Allen.....	571	Tuscarawas.....	621
Person.....	3	Ashland.....	459	Union.....	589
Pitt.....	13	Ashland.....	459	Van Wert.....	556
Polk.....	11	Ashland.....	459	Vinton.....	399
Randolph.....	10	Ashland.....	459	Warren.....	411
Richmond.....	0	Ashland.....	459	Washington.....	992
Robeson.....	9	Ashland.....	459	Wayne.....	619
Rockingham.....	20	Ashland.....	459	Williams.....	586
Rowan.....	8	Ashland.....	459	Wood.....	923
Rutherford.....	2	Ashland.....	459	Wyandot.....	414
Sampson.....	6	Ashland.....	459		
Stanly.....	3	Ashland.....	459	Total.....	57,067
Stokes.....	9	Ashland.....	459	<i>Oklahoma Territory.</i>	
Surry.....	22	Ashland.....	459	First.....	192
Swain.....	14	Ashland.....	459	Second.....	125
Tennessee.....	17	Ashland.....	459	Third.....	38
Tyler.....	5	Ashland.....	459	Fourth.....	48
Union.....	7	Ashland.....	459	Fifth.....	121
Vance.....	5	Ashland.....	459	Sixth.....	79
Wake.....	30	Ashland.....	459	Not reported by divisions.....	425
Warren.....	10	Ashland.....	459		
Washington.....	35	Ashland.....	459	Total.....	983
Watauga.....	23	Ashland.....	459	<i>Oregon.</i>	
Wayne.....	18	Ashland.....	459	Baker.....	59
Wilkes.....	48	Ashland.....	459	Benton.....	75
Wilson.....	10	Ashland.....	459	Clackamas.....	102
Yadkin.....	7	Ashland.....	459	Clatsop.....	37
Yancey.....	44	Ashland.....	459	Columbia.....	40
		Ashland.....	459	Cook.....	61
Total.....	1,772	Ashland.....	459	Crook.....	10
<i>North Dakota.</i>		Ashland.....	459	Curry.....	14
Barnes.....	02	Ashland.....	459	Douglas.....	66
Benson.....	29	Ashland.....	459	Gilman.....	22
Billings.....	8	Ashland.....	459	Grant.....	27
Bismarck.....	11	Ashland.....	459	Harney.....	3
Bottineau.....	18	Ashland.....	459	Jackson.....	105
Burlington.....	17	Ashland.....	459	Josephine.....	36
Carroll.....	73	Ashland.....	459	Klamath.....	14
Cass.....	95	Ashland.....	459	Lake.....	13
Cavalier.....	18	Ashland.....	459		
Dickey.....	79	Ashland.....	459		

TABLE NO. 18.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>Oregon—Continued.</i>		<i>Pennsylvania—Cont'd.</i>		<i>South Dakota—Cont'd.</i>	
Lane.....	144	Union.....	199	Douglas.....	29
Linn.....	93	Venango.....	462	Edmonds.....	78
Malheur.....	6	Warren.....	417	Fall River.....	48
Marion.....	162	Washington.....	531	Fault.....	63
Morrow.....	27	Wayne.....	300	Grant.....	84
Multnomah.....	307	Westmoreland.....	878	Hamlin.....	35
Polk.....	34	Wyoming.....	324	Hand.....	103
Sherman.....	3	York.....	748	Hanson.....	60
Tillamook.....	22	Total.....	49,578	Harding.....	25
Umatilla.....	76	<i>Rhode Island.</i>		Hughes.....	64
Union.....	66	Bristol.....	50	Hutchinson.....	43
Wallowa.....	37	Kent.....	295	Hyde.....	35
Wasco.....	49	Newport.....	156	Jerauld.....	57
Washington.....	81	Providence.....	1,583	Kingsbury.....	124
Yam Hill.....	81	Washington.....	295	Lake.....	82
Total.....	1,893	Total.....	2,298	Lawrence.....	85
<i>Pennsylvania.</i>		<i>South Carolina.</i>		Lincoln.....	70
Adams.....	295	Abbeville.....	16	McCook.....	96
Allegheny.....	2,599	Aiken.....	10	McPherson.....	33
Armstrong.....	759	Anderson.....	11	Marshall.....	57
Beaver.....	655	Barnwell.....	6	Meade.....	4
Bedford.....	754	Beaufort.....	96	Meyer.....	8
Berks.....	916	Berkeley.....	24	Miner.....	67
Blair.....	915	Charleston.....	79	Minnehaha.....	127
Bradford.....	1,582	Chester.....	16	Moody.....	65
Butler.....	907	Chesterfield.....	5	Pennington.....	84
Cambria.....	541	Clarendon.....	6	Potter.....	32
Cameron.....	119	Colleton.....	23	Roberts.....	26
Carlton.....	297	Darlington.....	13	Roberts.....	31
Centre.....	828	Edgefield.....	23	Saborn.....	11
Chester.....	742	Fairfield.....	9	Shannon.....	152
Clarion.....	764	Florence.....	2	Spink.....	9
Clearfield.....	598	Georgetown.....	5	Stanley.....	36
Cinton.....	141	Greenville.....	23	Sully.....	30
Columbia.....	397	Hanilton.....	9	Todd.....	8
Crawford.....	875	Horry.....	6	Turner.....	65
Cumberland.....	365	Kershaw.....	8	Union.....	85
Dauphin.....	933	Lancaster.....	18	Waiworth.....	20
Delaware.....	450	Laurens.....	13	Yankton.....	59
Elk.....	115	Lexington.....	2	Total.....	3,617
Erie.....	1,184	Marion.....	4	<i>Tennessee.</i>	
Fayette.....	744	Marlborough.....	2	Anderson.....	278
Forest.....	20	Newberry.....	8	Bedford.....	68
Franklin.....	480	Oconee.....	9	Benton.....	28
Fulton.....	171	Orangeburgh.....	9	Bledsoe.....	33
Greene.....	420	Pickens.....	7	Bloount.....	252
Huntingdon.....	679	Richland.....	42	Bradley.....	109
Indiana.....	658	Spartanburgh.....	28	Campbell.....	138
Jefferson.....	618	Souther.....	14	Cannon.....	32
Juniata.....	292	Union.....	5	Carroll.....	111
Lackawanna.....	697	Williamsburgh.....	4	Carter.....	267
Lancaster.....	1,372	York.....	8	Cheatham.....	19
Lawrence.....	477	Total.....	563	Chester.....	11
Lebanon.....	502	<i>South Dakota.</i>		Clatsborne.....	157
Lehigh.....	392	Aurora.....	107	Clay.....	63
Luzerne.....	1,632	Baeldle.....	237	Cocke.....	133
Lycoming.....	716	Bon Homme.....	53	Coffee.....	68
McKean.....	408	Brookings.....	119	Crockett.....	16
Mercer.....	667	Brown.....	162	Cumberland.....	34
Mifflin.....	338	Burdle.....	106	Davidson.....	232
Monroe.....	190	Butte.....	17	Decatur.....	18
Montgomery.....	741	Campbell.....	21	De Kalb.....	146
Montour.....	193	Charles Mix.....	52	Dickson.....	35
Northampton.....	649	Clark.....	61	Dyer.....	23
Northumberland.....	594	Clay.....	71	Fayette.....	26
Perry.....	458	Codington.....	98	Fentress.....	51
Philadelphia.....	9,797	Custer.....	64	Franklin.....	44
Pike.....	65	Davison.....	115	Gibson.....	37
Potter.....	510	Day.....	63	Gilca.....	114
Schuylkill.....	823	Deuel.....	66	Grainger.....	181
Snyder.....	261			Greene.....	479
Somerset.....	775			Grundy.....	16
Sullivan.....	88			Hamblen.....	147
Susquehanna.....	736			Hamilton.....	273
Tioga.....	1,243			Hancock.....	124

TABLE NO. 14.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>Tennessee—Continued.</i>		<i>Texas—Continued.</i>		<i>Texas—Continued.</i>	
Hawkins	268	Bowie	31	Jack	27
Haywood	17	Brazoria	18	Jackson	6
Henderson	77	Brazos	22	Jasper	13
Henry	24	Brown	26	Jefferson	6
Hickman	53	Burleson	9	Jeff Davis	3
Houston	12	Burnet	41	Johnson	24
Humphreys	18	Caldwell	44	Jones	4
Jackson	66	Calhoun	6	Karnes	4
James	69	Callahan	11	Kaufman	48
Jefferson	270	Cameron	25	Kendall	11
Johnson	194	Camp	5	Kent	3
Knox	685	Carson	2	Kerr	13
Lake	21	Cass	20	Kimble	3
Lauderdale	19	Chambers	4	Kinney	20
Lawrence	45	Charlton	19	Knox	1
Lewis	11	Childress	3	Lamar	84
Lincoln	31	Clay	32	Lampasas	32
London	144	Coleman	13	La Salle	4
McMinn	193	Collins	191	Lavaca	16
McNairy	91	Colorado	29	Lee	11
Marion	121	Conal	78	Leon	19
Madison	50	Comanche	27	Liberty	3
Marion	68	Concho	1	Limestone	22
Marshall	49	Cook	74	Lipscomb	16
Mary	31	Correll	32	Live Oak	8
Meigs	82	Cottle	2	Llano	28
Monroe	96	Crockett	12	McCluskey	4
Montgomery	49	Crosby	1	McLennan	90
Moore	6	Dallas	170	McMullen	3
Morgan	85	Deaf Smith	1	Madison	3
Ohio	50	Delta	17	Marion	21
Oreston	62	Denton	68	Mason	11
Perry	22	De Witt	28	Maverick	10
Pickett	76	Dickens	2	Medina	1
Pock	63	Dimit	7	Menard	4
Putnam	78	Douley	4	Midland	0
Rhea	110	Duval	4	Mills	47
Rhodes	283	Eastland	20	Mills	9
Robertson	33	Ector	1	Mitchell	9
Rocheford	58	Edwards	11	Montague	73
Scott	61	Ellis	44	Montgomery	27
Sequatchie	8	El Paso	87	Morris	8
Savner	287	Erath	86	Nacogdoches	22
Shelby	268	Falls	26	Navarro	54
Smith	108	Fannin	167	Newton	9
Stewart	21	Fayette	35	Nolan	6
Sullivan	137	Fisher	4	Nocona	10
Sumner	67	Floyd	3	Ochiltree	5
Tipton	36	Fort Bend	8	Oldham	2
Trousdale	14	Franklin	9	Orange	19
Union	81	Frostons	22	Palo Pinto	22
Union	159	Frio	16	Panola	14
Van Buren	6	Galveston	57	Parker	51
Warren	39	Gillespie	24	Pecos	4
Washington	965	Goliad	12	Polk	7
Wayne	61	Gonzales	39	Potter	2
Weakley	72	Gray	2	Presidio	6
White	84	Grayson	216	Rains	8
Williamson	45	Gregg	22	Red River	41
Wilson	60	Grimes	14	Refugio	1
		Guadalupe	26	Roberts	2
Total	9,680	Hale	2	Robertson	27
		Hall	2	Rockwell	0
<i>Texas.</i>		Hamilton	24	Runnels	4
Anderson	27	Hardeman	8	Rusk	26
Angelus	8	Hardin	5	Sabine	10
Aransas	1	Harris	78	San Augustine	22
Archer	7	Harrison	27	San Jacinto	7
Atascosa	13	Haskell	3	San Patricio	4
Austin	13	Hays	21	San Saba	10
Bandera	14	Hemphill	2	Scurry	2
Bastrop	34	Henderson	0	Shackelford	6
Baylor	6	Hidalgo	2	Shelby	46
Bee	14	Hill	45	Smith	44
Bell	72	Hood	21	Somervell	4
Bexar	211	Hopkins	24	Starr	10
Blanco	19	Houston	32	Stephens	8
Bosque	24	Howard	6	Stonewall	4
		Hunt	79	Sutton	1

TABLE NO. 18.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>Texas—Continued.</i>		<i>Virginia.</i>		<i>Virginia—Continued.</i>	
Tarrant.....	154	Aecomack.....	85	Richmond.....	7
Taylor.....	17	Albemarle.....	85	Roanoke.....	24
Trockmorton.....	2	Alexandria.....	81	Rockbridge.....	28
Titus.....	9	Alleghany.....	7	Rockingham.....	80
Tom Green.....	11	Amelia.....	12	Russell.....	13
Travis.....	102	Amherst.....	24	Scott.....	28
Trinity.....	18	Appomattox.....	12	Shenandoah.....	10
Tyler.....	26	Augusta.....	68	Smyth.....	4
Upshur.....	14	Bath.....	4	Southampton.....	10
Val Verde.....	23	Bedford.....	20	Spottsylvania.....	35
Van Verde.....	4	Bland.....	2	Stafford.....	10
Van Zandt.....	40	Botetourt.....	10	Surry.....	12
Victoria.....	12	Brunswick.....	14	Sussex.....	7
Walker.....	14	Buchanan.....	8	Tazewell.....	11
Waller.....	5	Buckingham.....	16	Warren.....	10
Washington.....	28	Campbell.....	85	Warwick.....	10
Webb.....	26	Caroline.....	20	Washington.....	29
Wharton.....	4	Carroll.....	12	Westmoreland.....	7
Wheeler.....	8	Charles City.....	5	Wise.....	15
Wichita.....	24	Charlotte.....	11	Wythe.....	14
Wilbarger.....	31	Chesterfield.....	34	York.....	13
Williamson.....	70	Clarke.....	8		
Wilson.....	18	Craig.....	3	Total.....	3,886
Wise.....	68	Culpeper.....	15		
Wood.....	17	Cumberland.....	16	<i>Washington.</i>	
Young.....	10	Dickenson.....	5	Adams.....	10
Zapata.....	3	Dinwiddie.....	65	Asotin.....	11
Total.....	4,608	Elizabeth City.....	1,603	Chehalis.....	76
<i>Utah Territory.</i>		Essex.....	6	Challam.....	15
Beaver.....	18	Fairfax.....	62	Clarke.....	129
Box Elder.....	6	Fauquier.....	26	Columbia.....	41
Cacabe.....	18	Floyd.....	16	Cowalla.....	40
Davis.....	10	Fluvanna.....	9	Douglas.....	17
Emery.....	9	Franklin.....	23	Franklin.....	1
Garfield.....	8	Frederick.....	34	Garfield.....	41
Iron.....	6	Giles.....	6	Island.....	7
Juab.....	11	Gloucester.....	11	Jefferson.....	56
Kane.....	6	Goodland.....	8	King.....	333
Millard.....	8	Grayson.....	7	Kitsap.....	27
Morgan.....	2	Greene.....	1	Kittitas.....	48
Pi Ute.....	7	Groenville.....	5	Klickitat.....	32
Salt Lake.....	136	Halifax.....	21	Lewis.....	126
San Juan.....	1	Hanover.....	17	Lincoln.....	68
San Pete.....	17	Harico.....	152	Mason.....	13
Sevier.....	8	Henry.....	11	Okanogan.....	9
Summit.....	11	Highland.....	7	Pacific.....	22
Tooele.....	12	Ile of Wight.....	9	Pierce.....	247
Uintah.....	15	James City.....	3	San Juan.....	17
Utah.....	44	King and Queen.....	5	Skagit.....	42
Wasatch.....	3	King George.....	4	Skamania.....	10
Washington.....	18	King William.....	4	Snohomish.....	61
Weber.....	64	Lancaster.....	2	Spokane.....	202
Total.....	438	Lee.....	23	Stevens.....	20
<i>Vermont.</i>		Loudoun.....	51	Thurston.....	63
Addison.....	521	Lonisa.....	21	Wahkiakum.....	10
Bennington.....	302	Lunenburg.....	10	Walla Walla.....	96
Caldonia.....	646	Malden.....	8	Whatcom.....	96
Chittenden.....	553	Matthews.....	15	Whitman.....	120
Essex.....	161	Mecklenburgh.....	16	Yakima.....	43
Franklin.....	585	Middlesex.....	13	Total.....	2,155
Graul Isle.....	46	Montgomery.....	36	<i>West Virginia.</i>	
Lamoille.....	427	Namsemond.....	12	Barbour.....	91
Orange.....	560	Nelson.....	14	Berkeley.....	66
Orleans.....	674	New Kent.....	3	Boone.....	29
Rutland.....	766	Norfolk.....	435	Braxton.....	113
Washington.....	926	Northampton.....	43	Brooke.....	52
Windham.....	531	Northumberland.....	6	Cabell.....	210
Windsor.....	789	Nottoway.....	6	Calhoun.....	87
Total.....	7,541	Orango.....	23	Clay.....	22
		Page.....	13	Doddridge.....	188
		Patrick.....	15	Fayette.....	47
		Pittsylvania.....	28	Gilmer.....	104
		Powhatan.....	3	Grant.....	25
		Prince Edward.....	14	Greenbrier.....	33
		Prince George.....	7	Hampshire.....	25
		Princess Anne.....	16	Hancock.....	26
		Prince William.....	25		
		Palaski.....	12		
		Rappahannock.....	8		

TABLE NO. 18.—Showing the number of pensioners in each State and Territory and in each foreign country—Continued.

County.	No.	County.	No.	County.	No.
<i>West Virginia—Cont'd.</i>		<i>Wisconsin—Cont'd.</i>		<i>Foreign countries—Con.</i>	
Hardy	4	Marathon	158	Japan	5
Harrison	293	Marquette	64	Latvia	2
Jackson	285	Midwaukee	176	Nichols	29
Jefferson	61	Monroe	1,849	Netherlands	1
Kanawha	454	Oconto	513	New Zealand	8
Lewis	152	Ontonagon	113	Nicaragua	1
Lincoln	47	Outagamie	24	Norway	17
Logan	10	Ozaukee	299	Peru	1
M. Powell	27	Peppin	69	Portugal	1
Marion	332	Pierce	109	Russia	2
Marshall	292	Polk	297	Spain	11
Mason	476	Portage	120	South African Republic	2
Milner	10	Prairie	348	Sweden	20
Milwaukee	69	Price	54	Switzerland	73
Monongalia	254	Racine	195	Turkey	1
Monroe	12	Richland	527	U. S. of Columbia	2
Morgan	47	Rock	409	Uruguay	1
Nichols	23	St. Croix	290	Unknown	55
Ohio	904	Sauk	380		
Pendleton	24	Sawyer	83		
Pennsanta	125	Sauwau	68		
Pennsanta	21	Shelbygan	272		
Preston	432	Taylor	42		
Putnam	157	Trempealeau	185		
Raleigh	41	Vernon	324		
Randolph	27	Walworth	329		
Ritchie	204	Washington	28		
Reese	145	Washburn	161		
Summers	26	Waukegan	222		
Taylor	158	Waukegan	376		
Tucker	35	Waukegan	301		
Tyler	234	Waukegan	447		
Upshur	204	Wood	176		
Wayne	140				
Welster	21				
Wetzel	234				
Wirt	111				
Wood	529				
Wyoming	11				
Total	7,207				
<i>Wisconsin.</i>		<i>Wyoming.</i>		<i>Political divisions.</i>	
Adams	160	Albany	20	Alabama	1,645
Ashland	124	Carlton	25	Alaska Territory	9
Barron	185	Converse	12	Arizona Territory	233
Bayfield	37	Crook	25	Arkansas	4,022
Brown	322	Fronton	10	California	6,542
Buffalo	164	Johanson	29	Colorado	2,745
Burnett	28	Larson	81	Connecticut	6,807
Cadott	168	National Park Reser-	1	Delaware	1,107
Chippewa	316	vation	5	District of Columbia	4,548
Clark	280	Natrona	6	Florida	1,044
Columbia	351	Sheridan	12	Georgia	1,347
Crawford	280	Sweetwater	28	Idaho	392
Dane	557	Lincoln	28	Illinois	29,943
Dodge	211	Total	281	Indiana	47,798
Door	84			Iowa	22,189
Douglas	36			Kansas	22,321
Dunn	280			Kentucky	15,909
Emu Claire	345			Louisiana	1,510
Florence	10			Maine	15,994
Fond du Lac	404			Maryland	5,159
Forest	23			Massachusetts	21,897
Grant	680			Michigan	26,853
Green	359			Minnesota	6,259
Green Lake	168			Mississippi	1,298
Iowa	187			Missouri	23,740
Jackson	241			Montana	402
Jefferson	284			Nebraska	9,551
Jensen	378			Nevada	149
Kenosha	101			New Hampshire	7,035
Kewauwee	88			New Jersey	9,894
La Crosse	310			New Mexico Territory	381
La Fayette	191			New York	50,205
Langlade	89			North Carolina	1,772
Lincoln	88			North Dakota	1,724
Manitowoc	180			Ohio	57,087
				Oklahoma	368
				Oregon	1,891
				Pennsylvania	49,578
				Rhode Island	2,293
				South Carolina	343
				South Dakota	3,617
				Tennessee	9,680
				Texas	4,698
				Utah Territory	428
				Vermont	7,541
				Virginia	3,890
				Washington	2,155
				West Virginia	7,207
				Wisconsin	16,782
				Wyoming	781
				Foreign countries	2,625
				Grand total	507,293

TABLE NO. 19.—Names of surviving widows of revolutionary soldiers who have been regularly paid their pensions to June 4, 1890, with their ages and places of residence at that date.

Name of widow.	Age.	Name of soldier.	Service of soldier.	Post-office address of pensioner.		
				Town.	County.	State.
Aldrich, Lovey	90	Aldrich, Caleb	New Hampshire and Rhode Island troops.	Jackson	Jackson	Michigan.
Betz, Elizabeth	87	Betz, Peter	Pennsylvania troops.	Harrisburg	Dauphin	Pennsylvania.
Brown, Mary	85	Brown, Joseph	do	Knoxville	Knox	Tennessee.
Curtis, Susan	98	Curtis, Caleb	Massachusetts troops.	Topsham	Sagadahoc	Maine.
Dabney, Sarah	90	Dabney, John Q	Virginia troops.	Harry	Pike	Illinois.
Damon, Esther S	76	Damon, Noah	Massachusetts troops.	Plymouth Union	Windsor	Vermont.
Denmore, Jane	89	Merrill, James	Connecticut troops.	Brookfield	Fulton	New York.
Edena, Elias	72	Edena, Elias	South Carolina troops.	Clay City	Clay	Indiana.
Gregg, Nancy	79	Gregg, William	Virginia troops.	Collettsville	Clay	North Carolina.
Harbison, Jane	84	Harbison, James	South Carolina troops.	Pickensville	Calwell	North Carolina.
Heath, Sally	85	Heath, William	do	Titusville	Perry	Illinois.
Jones, Nancy	76	Darling, Joseph	Connecticut troops.	Jonesborough	Pulaski	Kentucky.
Lockwood, Betsey *	77	Mayo, Stephen	Virginia troops.	Darien	Washington	Tennessee.
Mayo, Rebecca	70	Mayo, Stephen	New York troops.	Newbern	Fairfield	Connecticut.
Morton, Olive C	89	Tuman, Peter	Connecticut troops.	Elva	Pulaski	Michigan.
Norse, Lucy	98	Morse, Abel	Virginia troops.	East Barnard	Tuscola	Vermont.
Rains, Nancy	89	Rains, John	New York troops.	Carter's Furnace	Windsor	Tennessee.
Richardson, Patty	87	Richardson, Godfrey	Massachusetts troops.	Shady Grove	Jefferson	Vermont.
Robertson, Nancy	85	Robertson, William	North Carolina troops.	Rochester	Monroe	Tennessee.
Salsbury, Maria A. *	74	Morgan, Abner	Virginia troops.	Newman	Jefferson	New York.
Smith, Meridy	85	Smith, William	North Carolina troops.	Parkley	Acomaco	Georgia.
Snead, Mary	80	Snead, Bowdoin	Connecticut troops.	Manchester	Ontario	Virginia.
Turner, Asenath	85	Durham, Samuel	Virginia troops.	Linebeck	Carter	New York.
Weatherman, Nancy	80	Glascok, Robert	Pennsylvania troops.	Easton	Northampton	North Carolina.
Young, Anna Maria	98	Young, Jacob	Pennsylvania troops.	Easton	Northampton	Pennsylvania.

* Daughters pensioned by special act.

REPORT OF THE SUPERINTENDENT OF CENSUS.

DEPARTMENT OF THE INTERIOR,
CENSUS OFFICE,

Washington, D. C., June 30, 1890.

SIR: I have the honor to report as follows relative to the operations of this office since the date of my last report, November 6, 1889.

THE COUNT OF THE PEOPLE.

Under the provisions of the act entitled "An act to provide for taking the Eleventh and subsequent censuses," approved March 1, 1889, the Eleventh Census of the United States should have been completed to-day so far as the enumeration is concerned. With the exception of a few cities, where the work of enumeration has been delayed in consequence of the failure of enumerators to start promptly June 2 or of supervisors to make sufficient subdivisions of their districts, the count of the population has been completed in all cities and towns throughout the United States. In the rural districts the enumeration is practically complete, though it is not unlikely that in some sparsely-settled parts of the country it may be necessary to extend the time for enumeration a few days into the month of July.

The first completed returns were received from supervisors during the week ending June 14, and four days later the Census Office began the machine tabulation in the Inter-Ocean Building. During the month of June completed returns were received from 4,437 districts, over 3,500 of which have been counted.

ORGANIZATION OF THE OFFICE.

Since my last report the work of organizing the office has been continued, and involved not only the preparation necessary to supply millions of schedules and blanks of all kinds to the army of enumerators which was placed in the field and began work June 2, but the examination of the credentials of the numerous applicants for supervisors' positions and the scrutiny of the formal applications of nearly 43,000 enumerators. While every provision was made for the prompt and thorough count of the people this month, the special work of the census has been in no way neglected, and the special agents, experts, and chiefs of divisions have been supplied with suitable quarters and sufficient clerical help to enable them to continue the separate inquiries which formed part of the plan of the Eleventh Census, already laid before you. While this special work has been strengthened in several respects, the scope of the census has not been broadened in any particular except to the extent called for by the act of February 27, 1890. The endeavor of the Superintendent has been to rigidly hold the responsible heads of the various divisions to the plans and specifications discussed and agreed upon during the spring and summer of 1889. The work of each of these divisions will be referred to subsequently in detail.

Upon the passage of the act of February 27, 1890, entitled "An act to require the Superintendent of the Census to ascertain the number of people who own farms and homes and the amount of the mortgage indebtedness thereon," it became necessary to incorporate into the population schedules the following questions:

26. Is the home you live in hired, or is it owned by the head or by a member of the family?

27. If owned by head or member of family, is the home free from mortgage incumbrance?

28. If the head of family is a farmer, is the farm which he cultivates hired, or is it owned by him or by a member of his family?

29. If owned by head or member of family, is the farm free from mortgage incumbrance?

30. If the home or farm is owned by head or member of family and mortgaged, give the post-office address of owner.

As already reported to you in a letter dated May 6, 1890, in answer to a resolution introduced by Senator F. M. Cockrell in the Senate of the United States and adopted April 22, 1890, it was decided that the enumerators should simply be called upon to secure the above information, which will enable the Census Office ultimately, by correspondence, by special agents, and in many cases by searching the records, to obtain with almost absolute accuracy and final completeness the facts required. By this method I hope to be able to tabulate and give to the country at a comparatively early date the number of persons in each county who own the homes they occupy and the farms they cultivate, the number of people who are tenants of homes and farms, the number of owned and tenanted farms, and the number of homes that are mortgaged and free from mortgage incumbrance. In consequence of the fact that these questions, and also certain questions relating to chronic diseases, were inserted in the population schedule, it was feared that many persons would refuse to answer the enumerators. It is gratifying to be able to report that the reverse has proved true, and that the questions, especially those relating to farms, homes, and mortgages, have been almost universally answered. In the few cases where refusals were made the matter was placed in the hands of United States district attorneys and answers secured without any further trouble either to the Census Office or to the Department of Justice. On June 12, 1890, the following telegram was sent to each supervisor:

Questions regarding mortgages, much more important than those regarding chronic diseases, and post-offices addresses of all persons owning mortgaged farms or homes, must, if possible, be secured. Wire me not later than Saturday night how far, according to your information, the mortgage questions are being properly answered.

In answer to this telegram 140 supervisors reported that the mortgage questions were being freely answered, and that they had heard of no refusals. In the remaining districts there were but few refusals reported, and in most of them only one or two.

By April 15 the President, by and with the advice and consent of the Senate, had appointed the supervisors for each of the 175 districts into which the country had been divided for purposes of enumeration.

FINANCIAL REPORT.

Disbursements on account of the Eleventh Census of the United States from the commencement of operations to the close of business June 30, 1890.

ADMINISTRATION.

For salaries.....	\$410,347.20
Furniture and fittings.....	37,840.12
Miscellaneous.....	266,586.50
Total.....	714,773.82

SPECIAL AGENTS.

For per diem	\$158,804.50
Traveling expenses	75,114.91
Miscellaneous	21,021.68
Total	254,941.09

SUPERVISORS.

For compensation	\$1,000.00
Clerk hire	5,857.85
Miscellaneous	625.16
Total	7,483.11
Grand total	977,198.62

PAY-ROLL.

One of the best illustrations of the growth of the Census Office is the following table, showing the total number of clerks, etc., on the pay-roll and the total amount paid to date:

Month.	Total No. on pay- rolls.	Total amount of pay-rolls.
April, 1889	6	\$302.75
May, 1889	33	2,368.05
June, 1889	54	4,511.05
July, 1889	69	5,464.75
August, 1889	97	7,492.05
September, 1889	129	8,831.75
October, 1889	176	11,818.75
November, 1889	252	15,613.70
December, 1889	362	19,706.10
January, 1890	432	27,080.50
February, 1890	629	35,401.05
March, 1890	831	52,366.75
April, 1890	987	62,294.45
May, 1890	1,122	73,771.90
June, 1890	1,291	82,135.85
		409,942.13

PRINTING, ENGRAVING, AND BINDING.

The act to provide for taking the Eleventh and subsequent censuses makes the appropriation which is available under it exclusive of printing, engraving, and binding. Under the ruling of the Treasury Department these expenses could not be paid out of the general appropriation. The matter was brought before the Appropriations Committee on the assembling of Congress, and a deficiency bill was passed entitled "An act making appropriations to supply a deficiency in the appropriation for public printing and binding for the fiscal year ending June 30, 1890, and for other purposes," which was approved December 19, 1889.

As will be seen, of this amount but \$172,029.34 has been paid out, although the outstanding obligations at the present time will require the total amount appropriated for printing, engraving, and binding prior to the enumeration.

The printing of over 80,000,000 blanks, circulars, schedules, etc., necessary for the enumeration, necessitated a large amount of work in

the way of preparation of copy, proof-reading, etc. The bulk of this work, of course, has been done at the Government Printing Office, as will be seen by the following statement :

Printing.

	Number of requisi- tions.	Number of copies printed.
Work done at Government Printing Office.....	950	74, 294, 543
Work done at Census Printing Office.....	734	5, 911, 505
Total.....	1, 744	80, 206, 350

CENSUS PRINTING OFFICE.

On September 4, 1889, you authorized the expenditure of \$2,600, and subsequently, on January 22, 1890, the expenditure of \$5,000 additional, under a section of the census law authorizing the Secretary of the Interior to purchase printing material. There has been established at the Third and G street building a thoroughly equipped printing office out of this amount, in compliance with section 24, act of Congress approved March 1, 1889, "for printing small blanks, tally sheets, circulars, etc."

It would be impossible for me to state in words the inestimable value of this printing office in the work of the census. The work has been of the best character and executed so promptly that the census investigations are much farther advanced than they would have been without the superior advantages afforded by having this outfit. On several occasions the Census Printing Office has been called upon to perform on short notice work that could not possibly have been done in time by any printing office not under the immediate control of the Superintendent of Census—work that required the attendance of printers and pressmen until midnight, and upon some occasions all night.

If the Census Office could be allowed the same control of the printing of the final reports under your direction, the volumes of the Eleventh Census could be published more expeditiously than by any other plan. I take this occasion to call attention to my recommendation relative to the necessity for prompt publication, made in the report of November 6, 1889, and to emphasize what was said at that time.

PREPARATION OF THE FINAL VOLUMES.

Every effort has been made to prepare in advance such maps and tables showing the geographical distribution of the mean annual temperature and the mean annual rainfall over the United States as will be used in the final volumes. Many of these maps have been compiled and are now ready for the engravers.

Lists of counties have been prepared and districted in accordance with latitude, longitude, mean annual temperature, mean annual rainfall, and drainage basins, in readiness for the distribution of the population by agricultural products and other data as shall be found necessary or desirable. The areas of the counties of the United States have also been measured by the geographical division of the Census Office for use in computing the density of population and other classes of data which depend upon area. The areas of drainage basins have also been

measured. Also, for the division of mortality, areas by wards and sanitary districts of cities have been measured and outlined. Maps of all large cities have been prepared, and are ready for the official returns. In this connection I wish to call attention to the necessity of securing for the Census Office the best engraving that can be done in this country. Some of the maps published in the volumes of the Tenth Census were regarded as models of workmanship and skill, competent European authorities declaring that they were the best of the kind ever published in Government reports. On the other hand, there were some maps which appeared in the volumes of those reports which were alike discreditable to the reports and to the Government. In my opinion, it is better to have no maps at all than to publish maps that are cheap, badly engraved, and misleading in every particular.

With your approval it is my intention to publish in connection with the census volumes a new statistical atlas of the United States, which shall show by maps and diagrams not only the wonderful progress of this country for the last decade, but for the century during which the decennial censuses have been taken. The groundwork for this atlas is already under consideration, and the detail work for it can be carried on simultaneously with the other work of the Census Office, so that it may be published immediately after the last volume, and thus be useful from a decennial as well as a centennial standpoint.

INSTITUTIONS.

In consequence of the many blunders, duplications, and omissions incident upon intrusting the enumeration of institutions to the regular enumerators, it was decided, for the purpose of enumerating the various institutions of the country, comprising the insane, idiotic and feeble-minded, blind, deaf and dumb, and physically defective, to appoint special enumerators, who should be named by the representatives of the institutions themselves. It is believed that this plan will work admirably. As a basis it was necessary to secure lists of these institutions. These lists were carefully verified and added to from every available record, including city directories, state reports, and similar publications. After these lists were completed and verified as far as possible from printed reports and other available data, a circular letter was mailed to each institution, calling for its character, name, and address, and the estimated population June 1, 1890, and for the designation of some suitable person to act as enumerator for said institution. This circular letter was mailed to 7,640 institutions and 4,258 private schools, colleges, etc. It will thus be seen that outside of the 43,000 enumeration districts the Census Office was called upon to deal with nearly 12,000 institutions, a large proportion of which were of sufficient importance to have appointed for each of them a special enumerator.

VETERANS.

Section 17 of the census act provides that the Superintendent of Census shall, under the authority of the Secretary of the Interior, cause to be taken on a special schedule of inquiry, according to such form as he may prescribe, the names, organizations, and length of service of those who had served in the army, navy, or marine corps of the United States in the war of the rebellion, and who are survivors at the time of said inquiry, and the widows of soldiers, sailors, or marines.

It was feared in the beginning (and so far as can be learned from the returns already received in the office these fears were well founded) that the enumerators would have great difficulty in securing the data required by the above section. While it was easy enough to find out from the wife, daughter, or housekeeper whether the head of the household did or did not serve in the war of the rebellion, yet it was almost impossible, without an interview with the person himself, to ascertain the facts called for by law. I deemed it expedient, therefore, to secure all possible information on this point elsewhere in advance, to act as a check upon the enumerator and to aid the office in carrying on the enormous amount of correspondence which, in all probability, will be necessary to make this inquiry as complete as it should be, in order to be of any value to Congress in basing future pension legislation thereon.

The preliminary list of surviving soldiers was obtained from the records of the Pension Office. This work was commenced December 9, 1889, and nine clerks were engaged during the balance of that month in culling duplicates and in otherwise preparing the Pension Office records for type-written transcripts, which was begun January 28, 1890, and completed during the month of March. The whole number of names transcribed was 458,677, while the whole number of duplicates culled was 146,477.

In addition to this work, requests were made for copies of the rosters of Grand Army posts throughout the country, calling for the names of members and data as to the organizations in which they served and the length of service in each organization. Application was also made for the state rosters and adjutant-generals' reports covering the war period, and for such other publications as were likely to be of value in the work of verification necessary to the completion of the special census of surviving soldiers, sailors, and marines who were mustered into the service of the United States during the late war, and of the widows of such as have died, as provided for by the census act. Whatever may be the result of the enumeration of the veterans of the war, the Census Office will have the satisfaction of knowing that it has taken every precaution to secure the data as promptly and accurately as possible.

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CRIME, PAUPERISM, AND BENEVOLENCE.

The work of this division of the Census Office has been classified under three heads: Crime, pauperism, and benevolence. Under the head of crime are embraced 215 prisons, penitentiaries, workhouses, and reformatories, 2,808 jails, and a large number of police stations and lock-ups.

In December last schedules were sent to the 215 prisons for the purpose of ascertaining their population on January 1, 1890; 109 have responded, 40 of which show an increase of about 25 per cent in the number of inmates as compared with the census returns of June 1, 1880, from the same institutions.

Of the 2,808 jails, 2,801 have reported the number of their inmates on January 1, 1890, which in the aggregate shows an increase of the jail population on that date of 100 per cent over the census returns of June 1, 1880.

In making these comparisons, however, it should be borne in mind that, as a rule, the winter population of jails is much larger than the summer population, and that, therefore, the census report of June 1, 1890, is likely to show a considerable decrease in this percentage.

Responses have been received to the special schedule from 691 police stations and lock-ups, and the same have been classified, ready to be tabulated when the tables for this special class are prepared.

Upon the recommendation of several wardens, superintendents, and keepers, special enumerators have been appointed for 181 prisons and 81 jails, to whom schedules have been sent.

One hundred thousand cards for the prisons and jails have been numbered and fully prepared for punching as soon as the schedules are returned.

The attorney-generals of the respective states have been communicated with respecting any changes in procedure of courts of criminal jurisdiction since June 1, 1880, and replies have been received from all but eight. The provisions of the various state constitutions relative to reprieves and pardons and in relation to the various state institutions have also been compiled from the respective statutes.

Under the head of pauperism reports have been received from 2,268 almshouses, showing an aggregate of 77,885 inmates, as against 66,203 in the same institutions in 1880.

An effort to obtain information respecting the outdoor poor who receive relief from other sources than almshouses is being made, but as yet the returns are too incomplete to form an estimate or comparison. One hundred thousand cards have been numbered and prepared for the almshouses and outdoor poor.

Under the head of benevolence printed lists of the benevolent institutions for 1880 have been revised, and the information concerning them obtained by the population division has been copied. This information covers 2,195 institutions, and shows a population of 140,977 in those which give the number of inmates. Many did not state the number. One hundred and fifty thousand cards have been numbered and prepared for these institutions.

While this division of the census was one of the last to complete its work in the Tenth Census, it bids fair to be among the first to complete it for the present census.

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REPORT OF THE COMMISSIONER OF RAILROADS.

DEPARTMENT OF THE INTERIOR,
OFFICE COMMISSIONER OF RAILROADS,
Washington, D. C., November 1, 1890.

SIR: In compliance with the statutory requirements of the act creating this Bureau (20 Stats., 169, sec. 3), I have the honor to submit the following report in regard to the Bureau and its operations, and of the condition of the property, business, and accounts of the several railroad companies coming under its supervision, which have made such reports as have been called for under the law.

REPORTS.

In my report under date of November 1, 1889, I called attention to the fact that several of the railroad companies which have received grants of public lands to aid in the construction of their roads declined to report to this Bureau, for the reason that such grants were made by

the respective States in which the roads are located and not by the United States, and it was claimed that, therefore, they do not come within the language of the act of Congress creating this Bureau and defining its powers. The point raised was that a grant to a State to aid in the construction of a railroad was not a grant to the railroad. As I could not agree with the position taken by certain railroad companies, I referred the subject to the Honorable Secretary of the Interior for instructions.

The matter was referred by the Secretary to the Assistant Attorney-General of the Department, who, after considering arguments both oral and written, submitted by attorneys of the railroad companies, held that under the law companies receiving subsidies of lands through the States, originally granted by the United States Government, were required to report to this Bureau.

The Secretary, in transmitting the opinion of the Assistant Attorney-General, said:

I herewith inclose to you a copy of the opinion of the Assistant Attorney-General in regard to the railroads receiving subsidies through the States originally granted by the United States Government, from which you will perceive that he holds that they are required to report to you, as you yourself have heretofore concluded. There has been a subsequent argument, made before the Assistant Attorney-General, but he adheres to his original opinion, which I approve and request you to act on officially.

Pursuant to the decision referred to and the quoted instructions from the Secretary, I called upon all the railroad companies coming within the scope of the instructions to make reports, and I am able to state that they have, with one or two exceptions, all cheerfully complied with the request.

IMPROVEMENTS.

During the past year, in company with the engineer of this Bureau I have traveled over nearly all the so-called "bonded" roads and many of the Pacific land-grant lines. I am able to report that many improvements, such as replacing iron rails with steel, putting in stone and iron culverts and bridges in place of wooden ones, reducing grades, ballasting, enlarging machine shops, building new station houses, adding to terminal facilities, increasing rolling stock, etc., have recently been and are continually being made. These improvements, where they are made upon the bonded roads, are of especial value to the Government, as they not only increase the earning capacity of the roads, and thereby the amount of net earnings to be paid in liquidation of the Government debt, but they add largely to the value of the property and so increase the Government security and render full final payment of the claims of the United States more certain.

Detailed mention of these improvements will be found in the report of the engineer, published herewith as Appendix No. 1.

RAILROAD OPERATIONS.

The operations of the railroads in the country at large for the past year show an improvement over the preceding year, although they have shared the general business depression that has prevailed, especially in the west. The net earnings of the bonded roads, in which the Government has a direct pecuniary interest, and to which earnings the Government looks, under existing laws, for reimbursement of subsidies granted in aid of the construction of the roads, show a slight falling off from the preceding year. Had it not been for unusual ex-

penditures for new equipment, notably in the purchase of Pullman sleeping, dining, and tourist cars by the Union Pacific, there would have been an increase in the net earnings of the bonded roads, and therefore the amount received by the Government this year would have been slightly in excess of the amount received last year.

The same unfortunate condition of things, as to the financial relations between the Government and the bonded roads, exists now that has always existed since the bonds granted in aid of their construction were issued, viz, that the amounts annually received from the roads fall largely below the amounts of interest annually accruing upon the subsidy bonds. The debts, therefore, due the Government from these roads, instead of being reduced, as it was the evident expectation of Congress that they would be, are rapidly increasing year by year. This increase, however, is not due to any failure of the railway companies to comply with the provisions of existing laws. The fault rests in the laws themselves. The per cent. of net earnings required by law to be paid in discharge of the Government obligations is not great enough to meet the interest which annually accrues upon the bonds issued to aid in the construction of the roads.

DECREASE OF BUSINESS.

Several causes have contributed toward this state of things, the most conspicuous ones being the building of numerous competing lines and the consequent reduction in both the volume and rates of traffic. No sane man at the time of the enactment of the legislation in aid of the bonded roads would have predicted that so many rival lines would be constructed at so early a day. As late as the date of the passage of the Thurman act (May 7, 1878) it was thought (and the estimates were made on the business of the roads at that time) that the 25 per cent. of the net earnings of the Union and Central Pacific roads required by that act to be paid to the United States would meet the annually accruing interest and provide a sinking fund that would extinguish the principal of the debt at the maturity of the bonds. A shrinkage instead of an increase in the net earnings of the roads, however, has shown how faulty were these estimates. Take the Union Pacific, for example. In 1879 the net earnings were \$5,769,635.40, while in 1889 they were only \$3,939,861.73, a shrinkage of nearly \$2,000,000, making the amount payable to the Government for the year 1889 nearly half a million dollars less than for the year 1879. Such a state of affairs was wholly unlooked for. Certainly no reasonable man could have expected it. The same situation exists with reference to the Central Pacific—a heavy reduction rather than the expected increase in their net revenues.

This is a rather bad showing for both the railroads and the Government; but it can not be fairly expected that this unfortunate state of affairs will long continue. There has been a general business depression. Values have shrunk; profits decreased; the products of the farm and the factory cheapened; the merchant realized less margins and the banker lower interest; money has been scarce and trade stagnant. No business is more seriously embarrassed by dull times than the transportation business.

But these causes have not alone operated to reduce the earnings of the bonded roads. Competition, and the reduced rates resulting from it, is what has crippled these as well as many other railroads. It is notoriously true that in many sections west of the Mississippi River and on the Pacific slope the mileage of railroads is greatly in excess of the legitimate needs of the carrying trade.

The last few years has seen a craze of railroad building in the West and many investments in railroad properties have failed to yield even the smallest dividends. It is safe to predict that the miles of railroad built in the next decade will fall far short of the miles built in the present one. Existing railroad properties will thus become more valuable as the country develops and trade increases. That the country will continue to grow there can be no doubt. Roads that now run for long distances through sparsely settled sections, depending almost wholly upon through traffic, will soon find thrifty settlements all along their lines, yielding a large and profitable local trade. The country will catch up with the railroads. Then the transportation business will be on a safe and paying basis, the speculative period of railroad construction will be ended, and the operations of traffic found to be increasing and profitable. When that time arrives, and its approach is certain and not distant, the bonded roads will show, as they ought to show, statements of largely increased net earnings, which will enable them to meet within a reasonable period their obligations to the Government and yield a fair return upon the investments of their stockholders.

DELAY IN SETTLEMENTS.

The strongest argument in favor of postponing, until nearer the maturity of the debts, a settlement with the bonded roads is in the fact that they will in all probability be in a much better financial condition in a few years from now than they are to-day. The reasons for expecting an improvement are suggested in the preceding paragraph. It is to be hoped that before 1897, when the principal and interest of the subsidy bonds become due, the roads in whose aid they were issued will be better able to arrange for their payment than they now appear to be. The Government hazards nothing by delay so long as the value of the properties on which it holds liens is being increased by the addition of valuable improvements.

FUNDING THE DEBTS.

The question of funding the debts of the bonded roads is one that has been widely discussed. Two of my predecessors in this office, successive Secretaries of the Interior and Treasury, and committees of Congress in reports and President Cleveland in a message to Congress have approved of this plan of settlement. The plan proposed is to fund the entire debt, principal and interest, of the Union and Central Pacific roads in obligations of fixed amounts and maturity. Funding bills were introduced in both Houses of Congress during the recent session similar in character to bills that had been introduced in previous sessions. The Senate Committee on railroads, through Mr. Frye, its chairman, reported unanimously in favor of the passage of the Senate bill, but no action was taken upon the report.

The provisions of the bill, briefly stated, are that the time of payment of the Union Pacific indebtedness shall be extended through a period of fifty years at 3 per cent. interest, and the indebtedness of the Central Pacific extended through a period of seventy-five years at 2 per cent. interest. Under the terms of this bill the present worth of the company's debts can be ascertained exactly. The payments provided for will be of fixed dates and amounts, represented by bonds maturing each six months for the periods named. Section 2 of the bill provides for additional security in the case of the Union Pacific as follows:

That the said Union Pacific Railway Company, successor to the Union Pacific Railroad Company and the Kansas Pacific Railway Company and the said Central Branch Union Pacific Railroad Company, be, and they hereby are, authorized to make, issue, and deliver to the Secretary of the Treasury, who is hereby authorized and directed to receive the same, each its certain indenture of mortgage, which shall bear date the first of July, eighteen hundred and ninety, covering and embracing the entire property of such company, real, personal, and mixed, including all the rights, title, and interest of such company in any stocks, bonds, or securities, or lands of any branch lines or auxiliary companies in which such company now has any interest, and all railroads now owned or hereafter acquired or constructed by such company, and all their branches, telegraph lines, rolling stock, fixtures, and property of every kind and description, as well as that which it, its successors, or assigns may hereafter acquire, subject to any bona fide legal, prior, and paramount lien, claim, or mortgage upon any railroad now owned by such company or upon any railroad which such company may acquire.

The bill also provides that the Central Pacific give additional security for the payment of the bonds proposed to be issued in settlement of its indebtedness to the Government.

The House committee was divided in its report, the majority favoring, but a large minority, through the chairman of the committee, reporting against the passage of the bill. The report of the minority stated that while those dissenting from the majority report had different reasons for so doing, they all agreed that as there are seven years before the subsidy bonds become due it is inexpedient to push a settlement at this time.

EXTENSION OF TIME.

It is very clear to my judgment that at some time previous to 1897, at which date the subsidy bonds become due, legislation will be necessary in making new adjustments in regard to the debts of the bonded roads to the United States. It can not be expected that the roads can discharge their debts at their maturity. It certainly would not be an act of wisdom on the part of the Government to pursue its legal and equitable rights as a second mortgagee and redeem the property by paying off the first-mortgage bonds and foreclosing its own mortgage in case the companies make default in 1897. It would be a great calamity should the Government be compelled to acquire the ownership and engage in the operating of these railroads. Time is of little importance to the Government. It is security that should be looked after in the adjustment of these matters. An extension of time at a fair rate of interest, conditioned upon the putting up by the companies of additional security, ought to be granted. This would strengthen the companies and, to the extent of the new securities acquired, make more certain the final payment of the Government claims.

As to whether or not the funding bills now pending sufficiently guard the interests of the Government is for the wisdom of Congress to determine. I am constrained to make the suggestion that in any law granting an extension of time the interest should be fixed at a rate not lower than the rate the Government is compelled to pay upon its obligations. The Government should not be a loser by granting an extension. I am sure the people of the country would not approve a policy that would involve the Government in loss. It ought to receive back all it pays out in behalf of these roads. It has been liberal in the past and may well consent to be lenient in the future. Ample time in which to pay should be given, but the interest received by the Government should be equal to that paid out by reason of the extension.

I do not share the apprehensions, sometimes expressed, that the principal bonded roads will never be able to pay their debts and that the Government will thereby lose, in whole or in part, the advances it has

made in aid of their construction. As I have before suggested, I believe the worst is over. Most of the territory tributary to these roads has already secured all the competing lines that are likely to be built for years to come. Heretofore, through the building of lines not warranted by the business of the sections through which they run, competition has been carried beyond healthy and legitimate bounds. Hereafter the volume of traffic is likely to increase much more rapidly than are the facilities for carrying it on, and, as a necessary result, the roads now in operation will secure a larger trade and realize increased profits. The Government has been extremely liberal, and wisely so, to these companies. Its loans of money and donations of land have been munificent indeed. In view of this the companies seeking an extension of their debt to the Government ought to be willing to pay such a rate of interest as will indemnify the Government from loss.

SIoux CITY AND PACIFIC.

The funding bills to which I have referred, now pending in Congress, include all the bonded roads except the Sioux City and Pacific. A bill has passed the Senate authorizing the Secretary of the Treasury, by and with the consent of the President, to negotiate with this road for a settlement of its indebtedness to the United States and to make such settlement as in the judgment of the Secretary shall be for the best interests of the Government.

The Sioux City and Pacific is a short road, a trifle over 100 miles in length, running from Sioux City, Iowa, to Fremont, Nebr. The road is owned and operated by the Chicago and Northwestern Railway Company. The United States loaned to this road \$1,628,320 in bonds to aid in its construction. The interest paid on these bonds by the United States to June 30, 1890, amounts to \$2,148,191, and there has been returned to the United States, in transportation services rendered the Government, the sum of \$165,047.16. The excess of interest paid over all credits amounts to \$1,983,144.73. This leaves now due the Government \$3,611,464.73. Under existing laws the amount required to be paid annually, viz, 5 per cent. of net earnings and half the Government transportation, amounts on an average to less than \$20,000 per annum.

The Government is certain to sustain a heavy loss on its claim against the Sioux City and Pacific. There are first-mortgage bonds taking precedence over the Government lien of \$1,628,000.

UNION PACIFIC GUARANTIES.

Certain criticisms, allegations, and complaints have come to this Bureau through the public press and in communications, both oral and written, from individuals, touching the management of the Union Pacific Railway Company in the matter of guaranteeing the bonds or stocks of other railway corporations whose lines of road are operated in connection with the Union Pacific system. It has been urged that these guaranties were made in violation of law and that they would have the effect, and were made with the purpose, of defrauding the Government. The Commissioner of Railroads, the Secretary of the Interior, and the President of the United States were urged to institute legal proceedings against the Union Pacific for its violation of law, and Senators and members of Congress have been importuned to take action in the matter.

On July 3 the following resolution was adopted by the United States Senate:

Resolved, That the Secretary of the Interior be directed to inform the Senate whether he has knowledge of the guaranty, actual or proposed, by the Union Pacific Railway Company of the bonds or stock of any other corporation, more especially those of the Oregon Railway and Navigation Company and of the Denver and South Park Railroad Company; whether said Union Pacific Railroad Company has paid out of its surplus earnings or otherwise the indebtedness, or any part thereof, of said or other companies, and if so whether such guaranty or such payment, or both, are in accordance with law and consistent with the obligations of said Union Pacific Railroad Company to the United States; and that the Secretary of the Interior be directed to communicate to the Senate all information in possession of his Department on the subject.

The resolution was referred by the Honorable Secretary to this office for reply. On July 17 a letter from this office was delivered to the Secretary giving a complete list of the companies whose bonds or stocks, or both, had been guaranteed by the Union Pacific Railway Company, together with a statement of the manner, form, and amounts specified under the name of each corporation. The letter further stated:

No part of the earnings of the Union Pacific Railway Company which are required under the law to be paid to the Government have been used for any other purpose than in liquidation of the Government debt. It is the uniform practice of this office to ascertain, as provided by law, the net earnings of the railway company upon which the Government has a claim, to wit, the net earnings from the aided portions of its road. When this amount is ascertained, 25 per cent. of the sum has been demanded, as provided by the Thurman act, and has been paid into the Treasury of the United States, either directly in cash or through the allowance for transportation services rendered by the company for the Government. This is in strict compliance with the provisions of the Thurman act, that 25 per cent. of the net earnings of each portion of the line as have been aided by the issue of Government bonds be paid annually into the Treasury. What the railway company may have done with the other 75 per cent. of its surplus earnings I have not deemed it the province of this office to inquire.

The Secretary fully answered the inquiries of the Senate and transmitted the correspondence with his report. His report concluded as follows:

Inasmuch as, according to the report of the Commissioner of Railroads, herewith sent, said company has complied with and continues to comply with all the requirements of Congress as to the payments to be made to the United States, and has made the investments referred to out of its own proper share of earnings, I do not see how its action in the premises can be fairly regarded as endangering or injuring the interests of the United States as creditor of said company, or be considered as otherwise than as legitimate and proper in the prosecution of its business. It has given no lien or mortgage on, or made any pledge of, its assets on which the United States have a lien, but seems to have simply used its credit and its share of income, as it had a right to do, in promotion of its proper purposes.

The legal aspects of the inquiry made by your body were referred to the Assistant Attorney-General for this Department. His opinion, which I herewith also send you, is to the effect that, on the facts as shown by the Railroad Commissioner, there has been no violation of the United States statutes governing this corporation by the company in these matters, or of its obligations to the Government. In these views I concur.

LEGISLATION NEEDED.

I earnestly renew the recommendations made in my previous report that the act creating this Bureau be further amended by providing that the so-called bonded roads transmit all accounts for transportation services rendered the Government, including the carrying of the mails, through this Bureau to the proper accounting officers of the Treasury; and that all disallowances or differences in said accounts found by the accounting officers upon settlement be reported to this Bureau before final payment or allowance of the same; and that this Bureau report to the Treasury Department what changes, if any, are required in the payment or disposal of the moneys so found to be due the said companies.

It is important that there be some bureau of the Government in which can be found full information as to the accounts between the bonded railroads and the United States. Up to the present time there has been no such bureau. Out of the numerous acts affecting the roads in question there has grown much confusion. The Post Office, War, Treasury, and Interior Departments each have extensive dealings with these roads. Bills for services rendered are sent for adjustment to many different accounting officers, each acting independently of the others. There are now millions of dollars of unsettled bills awaiting final action in the Treasury Department. It is due to the railroad companies that all these accounts for services be promptly adjusted and that such sums as are legally their due be credited or paid to them.

It is to the interest of the Government to know the exact condition of its accounts with the railroad companies it has aided and whose obligations it holds. As accounts are rendered at present it would be a vexatious and almost impossible task to secure such information. Were all accounts rendered through this Bureau by the railroad companies, and the action taken by the accounting officers reported here, all of which might be done with no increased expense, the records of this Bureau would at all times give easy access to any information that might be desired by Congress or any of the Departments of the Government in regard to the accounts and indebtedness of the bonded roads.

The Secretary strongly indorsed this recommendation in his last annual report. A bill providing for the amendment suggested was introduced in the Senate at its last session and, with trifling amendments, was unanimously passed.

The bookkeepers of this Bureau have fully investigated the books and accounts of the bonded roads, and statements are submitted herewith showing in detail their earnings and expenses and general financial condition, including the amounts due the Government on their net earnings for the year ending with this report, as well as the balances due on previous years. As a rule the accounts of the roads are kept in a thoroughly business-like manner. The officers of the roads have cheerfully given free access to their books when requested, furnished all information asked for, and submitted all vouchers it was desired to examine.

UNION PACIFIC RAILWAY COMPANY.

The Union Pacific Railway Company was formed January 26, 1880, by the consolidation of the Union Pacific Railroad Company, the Denver Pacific Railway and Telegraph Company, and the Kansas Pacific Railway Company, formerly the "Union Pacific Railroad Company, Eastern Division," which was the successor of the Leavenworth, Pawnee and Western Railroad Company. The road, as at present constituted, is 1,821.27 miles in length. The company also controls and operates eighteen branch lines, 3,358.79 miles in length, which makes an aggregate for the entire system of 5,180.06 miles. There are also seven railroad companies, whose lines aggregate 1,055.03 miles in length, in which the Union Pacific Railway Company has a proprietary interest, but the railroads belonging to which are not included in the system.

The portions of the road which were constructed by the aid of a subsidy in bonds and are subject to the requirements of law with respect to the annual payment of a percentage of earnings to the Government are as follows: Bridge Junction, Omaha, Nebr., to Ogden Station, Utah, 1,029.4840 miles; Ogden Station, Utah, to junction with Central Pacific

Railroad (leased and operated by the Central Pacific Railroad Company), 5 miles; Kansas City, Mo., to a point near Boaz, Kans., 393.9425 miles.

The subsidy bonds issued to this company amount to \$33,539,512, the Union Division having received \$27,236,512 and the Kansas Division \$6,303,000. The United States had paid in interest thereon the sum of \$45,173,778.54, and there had been repaid by the company in transportation services and cash, as shown by the books of the Treasury Department, \$20,995,727.97, which made its liability to the Government June 30, 1890, amount to \$51,717,562.57. The excess of interest paid by the United States over all credits amounted to \$18,178,050.57. The amount found due from this company under the acts of 1862, 1864, and 1878, for the year ending December 31, 1889, was \$1,076,139.35, whilst the United States paid during the corresponding period the sum of \$2,012,370.72 interest on the bonds issued to this company.

During the year 20,263 tons of steel rails were laid at a cost of \$627,155.13, and 971 tons of iron rails at a cost of \$46,719.21, and there were placed in the track 511,627 cross-ties at a cost of \$262,034.09. The total expenditures for additions and betterments to railway, charged to construction account, amounted to \$1,011,520.93 during the year.

There are 10.10 miles of double track and 481.37 miles of sidings. Steel rails are laid upon 1,809.23 miles of track and iron rails upon 504.10 miles. The ballast consists of 22.89 miles of stone, 18.01 miles of gravel, 4.86 miles of burnt clay, 28.53 miles of cinders, and the remainder of earth. There are 643 miles of fencing of all kinds.

The equipment consists of 487 locomotives, 467 of which are equipped with Westinghouse brakes; 69 Pullman sleeping and 11 dining cars, in which the company owns a three-fourths interest; 23 chair, 144 passenger, 70 emigrant, 105 baggage, mail, and express, and 13 officers' cars, making a total of 435 cars in the passenger department, all of which are equipped with Westinghouse brakes and Miller platforms. There are 5,616 box, 1,081 stock, 1,943 coal, 472 flat, 125 combination stock, 83 fruit, 427 refrigerator, 700 furniture, and 204 caboose cars, making a total of 10,651 cars in the freight department, 8,695 of which are equipped with Westinghouse automatic brakes. There are 270 cars used in road repair service. Included in the above are 115 locomotives, 88 passenger, 2,980 freight, and 100 dump cars, held in trust by the American Loan and Trust Company, of Boston, Mass., as trustee. The company has placed dining cars upon all of its through trains between Omaha, Nebr., and Portland, Oregon.

The company reports that it had disposed of 13,357,720.85 acres of land to June 30, 1890, the total cash receipts from all sales amounting to \$32,412,259.65. There remained outstanding on account of time sales the sum of \$10,306,280.22. The average price per acre for all sales was \$2.53 for the Union division, \$3.79 for the Kansas division, and \$4.42 for the Denver division. The company's estimate of unsold lands December 31, 1889, was 6,283,000 acres, valued at \$12,567,500.

The roadbed, track, bridges, buildings, and equipment of the main line between Omaha, Nebr., and Ogden, Utah, were inspected by the engineer of this Bureau in March, and of the Kansas division, between Kansas City, Mo., and Denver, Colo., in July of the present year. The entire line was found to have been maintained in excellent condition, and numerous important additions and improvements were made during the past year, the details of which will be found in Appendix No. 1.

The following statements show the financial condition of the company June 30, 1890, the amounts found due under the acts of 1862, 1864, and 1878, and other statistics pertaining to the road.

Comparative statement of the funded debt of the Union Pacific Railway Company June 30, 1890 and 1880.

Class of bonds.	Term of bonds.		Rate of interest.	Amount of bonds outstanding—		Difference.		Lien on—
	Years.	Date of maturity.		June 30, 1890.	June 30, 1889.	Increase.	Decrease.	
<i>Union Pacific Railroad Company.</i>								
Union Pacific, first mortgage.....	30	1896-1899	P. ch.	\$27,229,000.00	\$27,229,000.00			Road and franchise, Omaha to Ogden.
United States subsidy, second mortgage.....	30	1896-1899	6	27,229,512.00	27,229,512.00			Do.
Land-grant mortgage.....	20	1887-1889	7	10,000.00	38,000.00		\$28,000.00	Granted lands.
Sinking fund mortgage, coupon.....	20	1893	8	7,361,000.00	10,055,000.00		2,694,000.00	Road and franchise, Omaha to Ogden, third mortgage; granted lands, second mortgage.
Sinking fund mortgage, registered.....	20	1893	8	6,742,000.00	4,129,000.00	\$2,613,000.00		Bonds of branch lines held by trustees.
Collateral trust, 6 per cent.....	29	1908	6	4,035,000.00	4,142,000.00		107,000.00	Omaha Bridge, first mortgage.
Omaha Bridge.....	25	1896	8	1,032,000.00	1,167,000.00		135,000.00	
<i>Kansas Pacific Railway Company.</i>								
Eastern division, first mortgage.....	30	1895	6	2,240,000.00	2,240,000.00			Road and income, Kansas City to a point 140 miles west.
Middle division, first mortgage.....	30	1896	6	4,063,000.00	4,063,000.00			Road and income, 140th mile post to 394th mile post.
United States subsidy, second mortgage.....	30	1895-1898	6	6,303,000.00	6,303,000.00			Road and franchise, Kansas City to 394th mile post.
Denver Extension, first mortgage.....	30	1899	6	5,935,000.00	6,028,000.00		93,000.00	Road and lands, 394th mile post to Denver.
Leavenworth Branch, first mortgage.....	30	1896	7	18,000.00	18,000.00			Leavenworth Branch.
Income, coupon certificates.....	12	1886	6		70.00		70.00	Income.
Income, subordinated.....	50	1916	7	45,950.00	45,950.00			Do.
Consolidated mortgage.....	40	1919	6	12,710,000.00	12,931,000.00		221,000.00	Blanket mortgage, 779 miles of road and 394 miles of land grant.
Denver Extension, coupon certificates.....	12	1886	6	385.00	385.00			Income.
<i>Denver Pacific Railway and Telegraph Company.</i>								
Cheyenne Branch, first mortgage.....	30	1899	7	8,000.00	8,000.00			Cheyenne Branch, road and lands.
<i>Union Pacific Railway Company.</i>								
Trust 5 per cent, coupon.....	24	1907	5	5,113,000.00	5,235,000.00		122,000.00	Bonds of branch lines held by trustees.
Trust 5 per cent, registered.....	24	1907	5	18,000.00	18,000.00			Do.
Omaha Bridge renewal, second mortgage.....	21	1906	5	580,000.00	454,000.00	126,000.00		Omaha Bridge.
Equipment trust, series A.....	1 to 10	1898-1907	5	573,000.00	645,000.00		72,000.00	Equipment held by the American Loan and Trust Company, of Boston, as trustee.
Equipment trust, series B.....	1 to 10	1898-1907	5	1,684,000.00	1,823,000.00		142,000.00	Bonds of branch lines held by trustees.
Collateral trust, 4 1/2 per cent.....	29	1918	4 1/2	2,071,000.00	2,071,000.00		2,071,000.00	
Total funded debt.....				115,080,097.00	113,906,167.00	1,173,930.00		

Revenue and expenditures for the year ending June 30, 1890.

REVENUE.

Earnings	\$20,711,041.79
Dividends on stocks of other companies.....	367,535.60
Interest on bonds of this and other companies.....	1,762,147.13
Interest and income from miscellaneous investments.....	267,682.31
Receipts of the land department and trust income.....	1,628,329.85
Equipment sold	62,071.24
Miscellaneous land receipts.....	18,629.91
Total.....	<u>24,767,218.33</u>

EXPENDITURES.

Operating expenses and taxes	\$12,310,824.03
Interest on funded debt.....	4,970,641.49
Interest on other debt.....	367,376.68
Sinking-fund requirement, company.....	728,506.25
New construction.....	970,620.72
Expenses of the land department, taxes, etc.....	280,346.96
United States requirement.....	1,079,139.35
Premium on bonds bought and held in trust.....	1,047,850.97
Profit and loss	360,834.27
Premium on bonds redeemed, etc.....	131,633.34
Total.....	<u>22,516,041.36</u>
Surplus	<u>2,252,177.97</u>

In the following comparative statement of the financial condition of the company June 30, 1890-1889, the decrease of \$10,493,269.02 in the cost of "road, fixtures, and equipment," is accounted for by the company by reason of the fact that the expenditures for new construction, betterments, and new equipment, from February 1, 1880, the date of the consolidation of the Union Pacific, Kansas Pacific, and Denver Pacific companies, to December 31, 1889, which had, prior to the last-named date, been included under the head of cost of road, fixtures, and equipment, were, on December 31, 1889, written off or transferred to the debit of the company's general-income account.

The company also states that in closing the accounts for last year it seemed advisable to take advantage of the various consolidations and reorganizations which had been effected during it, in order to simplify the company's balance-sheet by charging off various book accounts. The balance credited general-income account represented accumulated surplus earnings since the organization of the company, as well as the undivided items of revenue from whatever source derived. On the other hand it was purely a book account, and did not represent cash, the sums entering into it having been long since invested in the company's road or its rolling stock, or in securities in the treasury. In so far as it did not represent cash or any available asset, the general-income account was therefore, to a certain extent, deceptive.

In like manner there were other accounts equally deceptive on the debit side of the company's books, representing investments made many years ago which had resulted in an apparent loss, or balances which could not be collected but which were still carried in account current, even though, as in the case of the Denver, South Park and Pacific Company, a reorganization had been effected. The increase in the company's liabilities, compared with the apparent decrease in its assets, is due mainly to the charges and transfers incident to the above-mentioned transactions.

*Comparative statement of the financial condition of the Union Pacific Railway Company,
June 30, 1890-1889.*

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
LIABILITIES.				
First-mortgage bonds.....	\$12,782,000.00	\$13,224,000.00	.....	\$142,000.00
Interest on same, due and accrued.....	860,805.00	1,155,380.00	.....	780,015.00
Interest on same, accrued, not due.....	1,002,177.50	189,560.83	\$812,616.67	.....
United States subsidy bonds.....	33,539,512.00	33,539,512.00	.....	.....
Interest on same paid by United States.....	45,173,778.84	43,161,407.82	2,012,370.72	.....
Other funded debt.....	38,758,685.00	37,142,655.00	1,615,930.00	.....
Interest on same, due and unpaid.....	93,539.24	225,659.24	.....	132,120.00
Interest on same, accrued, not due.....	538,220.01	592,350.17	5,870.84	.....
Dividends unpaid.....	19,709.27	23,117.27	.....	4,408.00
Bills payable.....	9,135,000.00	3,450,834.18	5,675,165.82	.....
Accounts payable.....	2,731,437.69	1,156,245.07	1,575,192.62	.....
Pay rolls and vouchers.....	4,539,705.42	1,818,928.96	2,720,776.46	.....
Called bonds.....	166,000.00	29,000.00	137,000.00	.....
Total debt.....	178,848,029.67	165,057,659.54	13,190,370.13	.....
Capital stock.....	60,868,500.00	60,868,500.00	.....	.....
Total stock and debt.....	239,716,529.67	226,526,159.54	13,190,370.13	.....
ASSETS.				
Road, fixtures, and equipment.....	\$155,685,070.61	\$166,178,339.63	.....	\$10,493,269.02
Land contracts, land cash, etc.....	13,481,555.52	17,759,388.88	.....	4,277,832.81
Fuel, material, and stores on hand.....	1,967,156.73	1,551,333.45	\$415,823.28	.....
Cash on hand.....	2,492,237.40	882,570.78	1,609,666.62	.....
Company's stocks and bonds owned by company.....	888,823.20	574,088.81	109,234.80	.....
Other stocks and bonds.....	32,060,163.71	40,395,635.56	.....	8,335,471.85
Other stocks and bonds held in trust.....	13,674,694.01	3,217,250.00	10,457,444.01	.....
Miscellaneous investments.....	1,372,400.83	875,436.24	496,964.59	.....
Advances payable in stocks and bonds.....	2,743,286.43	3,555,568.10	.....	812,281.67
Sinking funds in hands of trustees—company.....	8,670,818.25	4,186,811.21	4,483,007.04	.....
Bills receivable.....	1,312,183.84	391,233.84	920,950.00	.....
Accounts receivable.....	11,734,574.33	9,294,996.43	2,439,577.90	.....
Due from other companies on account of traffic.....	390,233.30	584,302.09	.....	194,068.79
Repaid the United States in transportation and cash.....	28,066,743.41	25,857,569.60	2,209,173.81	.....
Total assets.....	274,343,441.57	275,304,723.57	.....	961,282.00
Surplus.....	34,626,911.90	48,778,564.03	.....	14,151,652.13

In its general balance sheet the company claims credit for reimbursements to the Government, by transportation services and cash payments, amounting to \$28,066,743.41; but the following statement, compiled from reports furnished this office by the Treasury Department, of settled accounts and moneys paid into the Treasury to June 30, 1890, shows a difference of \$1,071,015.44, as follows:

Transportation applied to interest account.....	\$16,143,450.59	
Cash payments applied to interest account.....	433,409.58	
Total interest account.....		\$16,581,860.17
Transportation applied to sinking-fund account.....	7,385,265.22	
Cash payments applied to sinking-fund account.....	1,421,714.46	
Accumulated interest on sinking-fund investments....	1,606,888.12	
Total sinking-fund account.....		10,413,867.80
Total credits to June 30, 1890.....		26,995,727.97
Amounts of credits claimed by the company.....		28,066,743.41
Difference.....		1,071,015.44

As stated in my report for last year, a controversy has existed since 1886 between this Bureau and the Union Pacific Railway Company as to the amount rightfully due the Government under the acts of 1862, 1864, and 1878, the company claiming that the earnings of the Omaha Bridge and the income derived from the operation of Pullman sleeping cars (a three-fourths interest in which is held by the company) should be excluded before determining the net earnings upon which a percentage is due the Government. As the subject is now before the Court of Claims for a judicial determination of matters in controversy, the account for the year ending December 31, 1889, has been stated in accordance with the view heretofore taken by this Bureau, and the items above referred to have been included in the following statements:

Statement of amounts due the United States by the Union Pacific Railway Company for the year ending December 31, 1889, under act of May 7, 1878.

UNION DIVISION.

EARNINGS.

United States:		
Passenger	\$66,181.67	
Extra baggage	48.40	
Freight	87,607.98	
Mail	479,682.86	
Express	597.41	
Telegraph	1,194.94	
		<u>\$675,401.46</u>
Commercial:		
Passenger	2,789,831.95	
Sleeping cars	97,889.54	
Extra baggage	56,263.07	
Freight	10,035,637.38	
Company freight	242,425.76	
Express	343,077.09	
Telegraph	38,990.91	
Miscellaneous	164,340.02	
		<u>13,783,449.72</u>
Total earnings.....		14,418,850.13

EXPENSES.

Conducting transportation	\$3,768,823.32	
Maintenance of way and structures	1,119,400.23	
Maintenance of equipment	1,628,429.79	
General expenses and taxes	1,354,280.65	
Total operating expenses.....	7,780,942.99	
Interest on first-mortgage bonds	1,633,740.00	
New construction	588,328.81	
New equipment	475,976.65	
Total expenses under act May 7, 1878	\$10,478,988.45	
Net earnings.....	3,939,861.73	
Twenty-five per cent. of net earnings.....	984,965.43	

Apportioned on the basis of sleeping-car mileage, being 53.56 per cent. of \$188,763.07, income from sleeping cars.

The company is credited with \$120,562.50, interest paid during the year on outstanding trust-equipment bonds, and \$282,000.00 trust-equipment bonds redeemed during same period, making a total of \$402,562.50 expended, distributed on the basis of revenue train mileage, the proportion for this division being 70.425 per cent., amounting to \$283,504.64. Also the sum of \$359,357.75 expended for Pullman Association cars, distributed on the basis of sleeping-car mileage, the proportion for this division being 53.56 per cent., amounting to \$192,472.01, making a total of \$475,976.65 credited on account of new equipment.

Statement of the amounts due the United States, etc.—Continued.

DUE THE UNITED STATES.

One-half Government transportation, as above.....	\$317,700.73
Five per cent. of net earnings.....	196,993.09
To credit of bond and interest account.....	514,693.82
One-half Government transportation, as above.....	317,700.73
Cash payment under section 4, act May 7, 1878.....	152,570.88
To credit sinking-fund account.....	470,271.61
Total for the year.....	984,965.43

KANSAS DIVISION—AIDED LINE.

EARNINGS.

United States:	
Passenger.....	\$8,755.55
Extra baggage.....	3.33
Freight.....	14,070.14
Mail.....	79,652.89
Express.....	181.45
Telegraph.....	349.87
	\$103,013.23
Commercial:	
Passenger.....	800,653.94
Sleeping cars*.....	24,982.34
Extra baggage.....	13,097.42
Freight.....	1,866,650.25
Company freight.....	80,981.83
Express.....	56,259.40
Telegraph.....	5,623.93
Miscellaneous.....	129,664.55
	2,977,913.66
Total earnings.....	3,080,926.89

EXPENSES.

Conducting transportation.....	\$817,754.73
Maintenance of way and structures.....	465,319.49
Maintenance of equipment.....	410,062.75
General expenses and taxes.....	303,646.88
Total operating expenses.....	1,996,783.85
New construction.....	176,030.98
New equipment†.....	114,766.04
Total expenses under act July 2, 1864.....	\$2,287,580.87
Net earnings.....	793,346.02
Five per cent. of net earnings.....	39,667.30

DUE THE UNITED STATES.

One-half Government transportation, as above.....	51,506.62
Five per cent. of net earnings.....	39,667.30
Total for the year.....	91,173.92

* Apportioned on basis of sleeping-car mileage, being 13.67 per cent. of \$182,753.07, income from sleeping cars.

† The sum of \$402,562.50 expended on account of interest paid and trust equipment bonds redeemed, is apportioned on the basis of revenue train mileage, the proportion for this division being 16.306 per cent., amounting to \$65,641.84. Also 13.67 per cent. of \$359,357.75 expended for Pullman Association cars, amounting to \$49,124.20, apportioned on the basis of sleeping-car mileage, making a total of \$114,766.04 credited this account for the year. (See note to statement for Union Division.)

Statement of the amounts due the United States, etc.—Continued.

DUE FROM THE UNION PACIFIC RAILWAY COMPANY.

On account of the Union Division.....	\$284,955.43
On account of the Kansas Division.....	91,153.92
Total for the year.....	<u>1,076,139.25</u>

Comparative statement of the earnings and expenses of the Union Pacific Railway Company.

	Year ending—		Differences.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger.....	\$4,325,891.20	\$4,480,812.20		\$154,921.00
Freight.....	14,575,124.24	12,819,981.95	\$1,755,142.29	
Mail.....	913,037.28	622,968.50	290,068.78	
Express.....	843,073.77	481,587.75	361,486.02	
Miscellaneous.....	451,905.24	528,160.79		\$76,255.55
Total.....	<u>20,714,031.79</u>	<u>18,933,512.99</u>	<u>1,780,518.80</u>	
EXPENSES.				
Maintenance of way and structures.....	2,056,803.93	1,933,963.45	122,840.48	
Maintenance of equipment.....	2,689,821.16	2,129,690.79	560,130.37	
Conducting transportation.....	5,623,628.43	5,045,538.72	578,089.71	
General expense and taxes.....	1,942,828.51	2,162,895.73		\$220,067.22
Total.....	<u>12,310,834.03</u>	<u>11,271,988.71</u>	<u>1,038,845.32</u>	
Net earnings.....	<u>8,403,197.76</u>	<u>7,661,524.28</u>	<u>741,673.48</u>	
Average miles operated.....	1,821.27	1,822.12		.85
Earnings per mile.....	\$11,371.75	\$10,868.55	\$503.20	
Expenses per mile.....	6,759.49	6,185.88	573.61	
Net earnings per mile.....	<u>4,612.26</u>	<u>4,682.67</u>	<u>70.41</u>	
Percentage of expenses to earnings.....	59.44	59.69		.25

CENTRAL PACIFIC RAILROAD COMPANY.

This road is operated by the Southern Pacific Company, under lease of February 17, 1885, and the modification thereof, dated January 1, 1888, the terms of which are stated in detail on page 25 of the report of this office for the year 1889.

The total length of road owned and operated June 30, 1890, was 1,360.28 miles, no change having been made during the past year. The main line extends from Oakland wharf, California, to Ogden, Utah, with branches from Roseville Junction to the Oregon State line, Lathrop to Goshen, and from Niles northward to Oakland and southward to San José, California. That portion of the line extending from Ogden, Utah, to Sacramento, thence via Niles to San José, California, a distance of 560.06 miles, was aided by the United States with bonds and lands, and is subject to the requirements of law with respect to the payment of a percentage of its net earnings to the Government.

The subsidy bonds issued to aid in its construction amounted to \$27,835,080, and the United States had paid as interest thereon the sum of \$3,820,189.81. There had been repaid by the company, in transportation services and cash, the sum of \$11,319,104.42, making a net liability on June 30, 1890, of \$26,515,975.39. The excess of interest paid

by the United States over all credits amounted to \$25,471,085.39. The amount found due under the act of May 7, 1878, for the year ending December 31, 1889, was \$458,242.89, whilst the United States paid during the corresponding period the sum of \$1,671,340.80 interest on the bonds issued to this company.

The roadbed, track, bridges, buildings, shops, and equipment were inspected by the engineer of this Bureau and found to be in good condition. The details of improvements made during the year will be found in his report, Appendix No. 1.

Owing to the unprecedented fall of rain and snow during the past year, in the section of country traversed by this line, causing serious washouts and landslides, and a consequent interruption of traffic, the earnings of the road were considerably reduced and the company subjected to great expense to repair damages to track, bridges, and snowsheds. At Alta, a station on the Sierra Nevada Mountains, about 3,600 feet above the sea level, the snowfall, between November, 1889, and March, 1890, measured 400 inches, whilst at Cisco, 23 miles east and near the summit, at an altitude of about 6,800 feet, it measured 628 inches. The rainfall in the valleys was also excessive during the same period, 40 inches having been registered at San Francisco, 103 inches at Delta, on the Oregon division, and 111 inches at Boulder Creek, north of Santa Cruz, particular reference to which will be found in the report of the engineer.

During the year the company laid 6740.82 tons of steel rails, at a cost of \$223,555.51, and 391,142 cross-ties, at a cost of \$152,403.68, all of which was charged to income account. The expenditures for new construction amounted to \$295,528.29. The repairs of bridges and culverts cost \$57,911.62, buildings, \$77,809.14, and snowsheds \$4,555.35. There are 684 miles of track ballasted with stone and gravel and 665 miles with earth. There are 846.90 miles of fencing and 32.54 miles of snowsheds.

The equipment consists of 245 locomotives, all of which are equipped with Westinghouse brakes; 18 sleeping, 168 first-class, 72 emigrant and tourist, 16 mail, 43 baggage, 10 express, and 7 officers' cars, making a total of 334 cars in the passenger department, all of which are equipped with Westinghouse brakes and Miller platforms. In the freight service there are 2,587 box, 1,760 flat, and 102 caboose cars, making a total of 4,449 cars in this department, all of which are equipped with Westinghouse brakes. There are 173 cars used in road-repair service. In order to provide additional conveniences to travelers, the company has ordered the construction of several dining cars, and expects to have them in service at an early date.

The company reports that there had been patented 2,402,384.34 acres of land, 1,039,710.59 being on account of the Central Pacific and 1,362,673.75 on account of the California and Oregon. There had been sold 2,558,499.72 acres and the total receipts from all sources to date amounted to \$8,864,154.96. There remained outstanding, on account of time sales, the sum of \$1,072,858.35. The records of the General Land Office show that to June 30, 1890, there had been patented 2,852,578.92 acres, the Central Pacific having received 1,040,210.59, the Western Pacific 449,931.72, and the California and Oregon 1,362,433.61 acres.

The following statements show the financial condition of the company June 30, 1890, the amount found due under the act of May 7, 1878, and other statistics pertaining to the road.

Comparative statement of the funded debt of the Central Pacific Railroad Company, June 30, 1890 and 1890.

Character of bonds.	Term of bonds.		Rate of interest.	Amount of bonds outstanding—		Difference.		Item.
	Years.	Date of maturity.		June 30, 1890.	June 30, 1893.	Increase or decrease.	Amount.	
Central Pacific Railroad Company.								
First mortgage:								
Series A	30	1895	Pr. 6	\$2,565,000	\$2,625,000	.....	.....	Road and franchise, Sacramento to State line.
Series B	30	1895	6	1,000,000	1,000,000	.....	.....	Do.
Series C	30	1895	6	1,000,000	1,000,000	.....	.....	Do.
Series D	30	1895	6	1,000,000	1,000,000	.....	.....	Do.
Series E	30	1897	6	2,997,000	3,021,000	.....	.....	Road and franchise, California State line to 5 miles west of Ogden.
Series F	30	1893	6	2,990,000	2,997,000	.....	.....	Do.
Series G	30	1898	6	2,993,000	2,997,000	.....	.....	Do.
Series H	30	1898	6	2,990,000	2,994,000	.....	.....	Do.
Series I	30	1898	6	2,911,000	3,011,000	.....	.....	Do.
United States subsidy, second mortgage	30	1895-1898	6	25,025,120	25,083,120	.....	.....	Road and franchise, Sacramento to 5 miles west of Ogden.
California State aid	20	1898	7	.....	5,000	Decrease ..	\$5,000	Sacramento to State line.
First mortgage:								
Series A extended (California and Oregon division)	30	1918	5	5,002,000	5,079,000	Increase ..	8,000	Road and franchise, Roseville Junction to Oregon State line.
Series A (California and Oregon division)	20	1898	6	.....	5,000	Increase ..	5,000	Do.
Series B (California and Oregon division)	20	1892	6	5,828,000	6,083,000	.....	.....	Do.
Land grant	20	1890	6	4,251,000	4,251,000	.....	.....	First mortgage, Central Pacific, and California and Oregon lands.
Fifty-year bonds of 1900 (a)	60	1900	6	55,000	3,022,000	Decrease ..	8,700,000	Lands granted by United States, and all other property, except aided line.
Fifty-year bonds of 1909 (a)	60	1909	6	9,872,000	.....	Increase ..	9,872,000	Lands granted, and all other property.
Western Pacific Railroad Company.								
Old loan	30	1895	6	111,000	111,000	.....	.....	Road and franchise, Sacramento to San José.
First mortgage:								
Series A	30	1895	6	1,825,000	1,830,000	.....	.....	Do.
Series B	30	1895	6	755,000	755,000	.....	.....	Road and franchise, Niles to Oakland.
United States subsidy, second mortgage	30	1905-1909	6	1,970,000	1,970,000	.....	.....	Road and franchise, Sacramento to San José.

		1890	8	133,000	133,000	.....	Road and franchise.
• <i>San Francisco, Oakland and Alameda Railroad Company.</i>		20					
First mortgage							
San Joaquin Valley Railroad Company.		30					
First mortgage			0	6,080,000	6,080,000		Road and franchise, Lathrop to Goshen.
Total				88,715,680	87,614,680	1,101,000	

(a) Eight million seven hundred and sixty-six thousand dollars 6 per cent. bonds of 1930 were exchanged during the year for \$3,872,000 5 per cent. bonds of 1939. These include \$1,500,000, in hands of trustees of land grant mortgage as collateral security, which do not draw interest.

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Revenue and expenditures for the year ending June 30, 1890.

REVENUES.

Earnings (guaranteed rental, 1889)	\$1,360,000.00
Land department (sales, etc., 1889)	602,179.80
Interest on sinking-fund of company	1,044,881.06
Sinking-fund requirement, paid by Southern Pacific Company, 1889 ..	275,000.00
United States requirement paid by the Southern Pacific Company, 1889 ..	458,242.89
Miscellaneous, dividends on stocks owned	14,400.00
	<hr/>
	3,754,703.75

EXPENDITURES.

Operating expenses	()
Interest on first-mortgage bonds	()
Interest on other funded debt	()
Interest on other debt	()
New construction	()
New equipment	()
Expenses of the land department	()
Sinking-fund requirements of company	\$1,274,137.55
United States sinking-fund requirement	458,242.89
Land receipts paid to trustees of land mortgage	602,179.80
Dividends Nos. 21 and 22, August 1, 1889, and February 1, 1890	1,345,510.00
Excess earnings of sinking funds over requirements, 1887-'89, paid by and now returned to Southern Pacific Company	379,813.55
Expenses for operations prior to lease	598.77
	<hr/>
Total	4,060,502.56
	<hr/>
Deficit	305,798.81

NOTE.—The revenue and expenditures include lease settlements to December 31, 1889, only. As the settlements under lease are made annually for the year ending December 31, the actual revenue can not be stated for year ending June 30, 1890.

*Comparative statement of the financial condition of the Central Pacific Railroad Company,
June 30, 1890 and 1889.*

	June 30, 1890.	June 30, 1889.	Difference.	
			Increase or decrease.	Amount.
LIABILITIES.				
First mortgage bonds.....	\$27,853,000.00	\$27,853,000.00		
United States subsidy bonds.....	27,853,680.00	27,855,680.00		
Interest on same paid by United States.....	36,820,180.81	35,148,849.01	Increase.....	\$1,671,340.80
Other funded debt.....	33,007,000.00	31,900,000.00	do.....	1,107,000.00
Dividends unpaid.....	62,305.00	64,502.00	Decrease.....	2,197.00
Accounts payable, pay-rolls and vouchers.....	262,346.29	263,355.60	do.....	1,009.40
Trustees land grant mortgages.....	2,501,170.59	2,160,940.04	Increase.....	340,230.55
Sinking funds uninvested.....	613,531.22	97,748.30	do.....	515,782.92
Total debt.....	129,065,312.91	125,290,165.10	do.....	3,769,147.81
Capital stock.....	68,000,000.00	68,000,000.00		
Total stock and debt.....	197,065,312.91	193,290,165.10	Increase.....	\$3,769,147.81
ASSETS.				
Cost of road, fixtures, and equipment.....	168,766,916.27	167,055,183.16	Increase.....	1,711,733.11
Land contracts—deferred payments on time sales.....	1,067,009.12	806,442.23	do.....	260,566.89
Cash on hand.....	104,678.30	128,749.38	Decrease.....	24,071.08
Company's stock owned by company.....	724,500.00	724,500.00		
Other stocks and bonds owned by company.....	832,615.00	832,615.00		
Miscellaneous investments.....	19,787.73	10,602.18	Increase.....	9,185.55
Sinking funds in hands of trustees.....	10,303,965.65	8,640,297.40	do.....	1,663,668.25

* Payable by lessee and charged in income account.

Comparative statement of the financial condition of the Central Pacific Railroad Company, June 30, 1890 and 1889—Continued.

	June 30, 1890.	June 30, 1889.	Difference.	
			Increase or decrease.	Amount.
ASSETS—continued.				
Collateral land trust	\$1,500,000.00	\$1,500,000.00	.....	.....
Bills and accounts receivable	1,891,731.96	1,182,485.34	Increase....	\$709,236.62
United States transportation and sinking-fund accounts.	10,967,182.67	10,508,939.68	do	458,242.99
Due from the United States in cash.....	1,068,161.67	1,068,161.67	.....	.....
Water front in San Francisco, Oakland, and Sacramento.	7,750,000.00	7,750,000.00	.....	.....
Farming lands unsold—estimated value .	*21,250,000.00	21,750,000.00	Decrease....	\$500,000.00
Total assets	226,386,548.27	222,737,302.19	Increase....	\$3,649,246.08
Surplus.....	29,271,235.36	29,461,187.09	Decrease....	189,951.73

* On account of conflicting and overlapping grants, adverse claims, desert lands, &c., the quantity of these lands to accrue, and their value, can not be closely estimated. The value above stated is derived from an estimate of the acres earned and to which the company would be entitled under the several acts of Congress, and applying the rate per acre fixed by the Government for adjoining lands, viz, \$2.50 per acre.

In its general balance sheet the company claims credit for reimbursements to the Government by transportation services and cash payments amounting to \$12,035,344.24, but the following statement compiled from reports furnished this office by the Treasury Department of settled accounts and moneys paid into the Treasury to June 30, 1890, shows a difference of \$686,239.82, as follows:

Transportation applied to interest account	\$6,075,668.54
Cash payments applied to interest account	658,263.26
Total interest account	6,733,951.80
Transportation applied to sinking-fund account	\$3,125,983.42
Cash payments applied to sinking-fund account	633,992.48
Accumulated interest on sinking-fund investments	855,176.72
Total sinking-fund account	4,615,152.62
Total credits to June 30, 1890	11,349,104.42
Amount of credits claimed by the company	12,035,344.24
Difference	686,239.82

Statement of amount due from the Central Pacific Railroad Company for the year ending December 31, 1889, under the act of May 7, 1878.

EARNINGS.

United States:	
Passenger	\$13,455.22
Freight	32,006.62
Mail	347,324.92
	<u>\$392,786.76</u>
Commercial:	
Passenger	2,385,927.45
Sleeping cars	46,240.39
Extra baggage	33,935.20
Freight	5,831,915.61
Express	101,588.85
Telegraph	30,120.00
Miscellaneous	149,100.19
	<u>8,578,827.69</u>
Total earnings	8,971,614.45

Statement of amount due from the Central Pacific Railroad Company, &c.—Continued.

EXPENSES.

Maintenance of way and structures.....	\$1,117,720.29
Maintenance of equipment.....	841,587.39
Conducting transportation.....	2,962,265.67
General expenses and taxes.....	908,613.50
New construction.....	161,124.99
Interest on first-mortgage bonds.....	1,671,180.00

Total expenses.....\$7,602,491.84

Net earnings.....1,309,122.61

Twenty-five per cent. of net earnings.....327,280.65

DUE THE UNITED STATES.

One-half transportation, as above.....	\$196,393.38
Five per cent. of net earnings, act 1864.....	65,456.13

Total to credit interest account.....\$261,849.51

One-half transportation, as above.....196,393.38

Total to credit sinking-fund account.....196,393.38

Total for the year.....458,242.89

Comparative statement of the earnings and expenses of the Central Pacific Railroad Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger.....	\$4,636,118.02	\$4,982,126.31		\$346,017.69
Freight.....	2,497,053.71	2,469,434.81		26,618.90
Mail.....	848,664.10	861,767.36		13,103.26
Express.....	116,487.16	199,038.13		82,550.97
Miscellaneous.....	524,790.06	403,214.14	\$120,684.91	
Total.....	15,293,512.64	15,296,669.95		3,083.31
EXPENSES.				
Maintenance of way and structures.....	2,245,159.17	2,079,466.91	165,692.26	
Maintenance of equipment.....	1,192,764.00	1,470,209.92		277,445.92
Conducting transportation.....	5,335,297.70	5,109,391.78		225,905.92
General expenses and taxes.....	1,570,775.00	1,471,290.30	99,484.70	
Total.....	10,343,695.87	10,129,358.91		214,336.96
Net earnings.....	4,949,816.77	5,167,311.04		217,494.27
Average miles operated.....	1,360.28	1,369.40		9.12
Earnings per mile.....	\$11,342.02	\$11,538.22		\$196.20
Expenses per mile.....	7,604.31	7,416.43		187.88
Net earnings per mile.....	3,638.61	3,921.79		283.18
Percentage of expenses to earnings.....	67.61	66.01	1.60	

CONDITION OF SINKING FUNDS.

The sinking funds of the Union and Central Pacific Companies held by the Secretary of the Treasury June 30, 1890, amounted to \$15,029,020.42, the Union Pacific having to its credit \$10,413,867.80 and the Central Pacific \$4,615,152.62.

The premium paid on bonds for the sinking fund of the Union Pacific to June 30, 1890, amounted to \$1,789,056.35, and the interest received from investments to \$1,606,888.12. For the Central Pacific the premium amounted to \$1,055,223.18 and the interest on investments to \$855,176.72.

The Secretary of the Treasury has made the following investments during the period from the creation of this fund in 1878 to June 30, 1890:

Character of bonds.	Union Pacific.	Central Pacific.	Total.
Funded loan of 1881, 5 per cent. extended at 3 per cent.	\$256,450.00	\$738,700.00	\$993,150.00
Funded loan of July 12, 1882, at 3 per cent.	1,620,000.00	1,220,000.00	2,840,000.00
Funded loan of 1907, 4 per cent.	4,478,650.00	199,100.00	4,677,750.00
Currency sixes, United States subsidy bonds	1,043,000.00	2,548,000.00	3,591,000.00
First mortgage bonds, of prior lien to United States.	4,608,300.00	1,009,000.00	5,675,300.00
Principal	12,064,400.00	5,712,800.00	17,777,200.00
Less bonds redeemed and sold.	3,446,050.00	2,155,800.00	5,602,450.00
Present principal	8,617,750.00	3,557,000.00	12,174,750.00
Premium paid.	1,789,056.35	1,055,223.18	2,844,279.53
Total cost.	10,406,806.35	4,612,223.18	15,019,029.53

Since December 31, 1887, the following investments have been made in the first-mortgage bonds of the Union and Central Pacific Companies: For the Union Pacific, \$3,839,300, at a premium of \$580,792.71, and for the Central Pacific, \$814,000, at a premium of \$132,374.53.

There remained in the Treasury of the United States uninvested June 30, 1890, the following amounts:

To the credit of the Union Pacific	\$7,061.44
To the credit of the Central Pacific	2,897.90
Total	9,959.34

SIoux CITY AND PACIFIC RAILROAD COMPANY.

This road extends from Sioux City, Iowa, to Fremont, Nebr., a distance of 107.42 miles. The entire line is laid with steel rails, and there are 26.35 miles of sidings and 217.69 miles of fencing. The road is operated by the Chicago and Northwestern Railway Company and forms a part of the latter's through line from Omaha to St. Paul.

The United States issued to the Sioux City and Pacific Railroad Company the sum of \$1,628,320 in bonds, to aid in the construction of 101.58 miles of road, that portion of the line between California Junction and Missouri Valley, Iowa, 5.84 miles, not being subsidized. The interest paid on these bonds by the United States to June 30, 1890, amounted to \$2,148,191.89, and there had been retained by the Treasury Department on account of transportation services rendered the Government the sum of \$165,047.16, leaving an aggregate due on that date of \$3,611,464.73. The excess of interest paid by the United States on all credits amounted to \$1,983,144.73. Under the acts of 1862 and 1864 the Government is entitled to receive from this company a sum equal to 5 per cent. of its net earnings and to retain one-half of the amounts due for transportation service rendered. These two amounts will not average \$20,000 per annum, whilst the interest paid annually by the United States on account of the bonds issued to aid in the construction of this road amounts to \$97,699.20.

The engineer of this Bureau inspected the road-bed, track, buildings, and equipment in July and found them in good condition. A number of improvements were made during the year, the details of which will be found in Appendix No. 1.

The equipment consists of 12 locomotives, 8 of which are equipped with Westinghouse brakes; 14 passenger cars, all of which are equipped with Westinghouse brakes and Miller platforms; and 90 box, 20 stock, 46 flat, and 12 caboose cars, making a total of 182 cars in service.

During the year 1,313.16 tons of steel rails were laid at a cost of \$49,456.26, and 2,970 cross-ties placed in the track at a cost of \$2,508.73. The expenditure for new construction amounted to \$3,108.15.

A grant of 41,398.23 acres of land was made to this company, all of which was sold April 15, 1875, to the Missouri Valley Land Company for \$200,000.

The following statements show the financial condition of the company June 30, 1890:

Financial condition of the Sioux City and Pacific Railroad Company June 30, 1890.

LIABILITIES.

First-mortgage bonds.....	\$1,628,000.00
Interest on first-mortgage bonds.....	50,595.00
United States subsidy bonds.....	1,628,320.00
Interest on same paid by United States.....	2,148,191.89
Interest on preferred stock, accrued, not due.....	2,957.51
Pay rolls and vouchers.....	62,125.71
Total debt.....	5,510,100.11
Capital stock.....	2,065,400.00
Total stock and debt.....	7,575,500.11

ASSETS.

Road, fixtures, and equipment.....	\$5,600,674.93
Fuel, material, and stores on hand.....	70,943.09
Cash on hand.....	174,125.26
Accounts receivable.....	57,086.63
Due from other companies on account of traffic.....	8,430.09
Withheld by United States for transportation services, etc.....	165,047.16
Due from the United States.....	61,198.74
Total assets.....	6,137,936.80
Deficit.....	1,440,653.31

Statement of revenue and expenditures for year ending June 30, 1890.

REVENUE.

Earnings.....	\$535,036.59
Profit and loss.....	3,740.89
Total.....	538,777.48

EXPENDITURES.

Operating expenses.....	\$325,372.46
Interest on first-mortgage bonds.....	97,680.00
Interest on other funded debt.....	97,020.20
Interest on other debt.....	2,477.18
New construction.....	3,108.15
New equipment.....	100.00
Interest on preferred stock.....	11,520.00
Total.....	538,266.99
Surplus.....	510.49

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Statement of amount due from the Sioux City and Pacific Railroad Company for the year ending December 31, 1889.

EARNINGS.

United States:		
Passenger.....	\$1,273.59	
Freight.....	676.60	
Mail.....	21,594.72	
		\$23,544.84
Commercial:		
Passenger.....	221,927.42	
Extra baggage	4,795.86	
Freight.....	234,277.17	
Express.....	9,860.87	
Miscellaneous.....	14,304.91	
		485,296.23
Total earnings.....		508,771.07

EXPENSES.

Maintenance of way and structures	71,845.96	
Maintenance of equipment	28,093.17	
Conducting transportation	146,851.36	
General expenses and taxes.....	48,988.38	
Total operating expenses	295,778.87	
New construction.....	7,186.03	
		302,964.90
Net earnings		205,806.17
Five per cent. of net earnings		10,290.31

DUE THE UNITED STATES.

One-half Government transportation, as above	11,772.42
Five per cent. of net earnings, act July 1, 1862	10,290.31
Total	22,062.73

Comparative statement of the earnings and expenses of the Sioux City and Pacific Railroad Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger.....	\$228,478.25	\$255,364.64		\$26,886.39
Freight.....	254,398.46	266,654.63		12,256.17
Mail.....	23,027.88	23,028.12		.24
Express.....	10,731.36	10,125.42	\$605.94	
Miscellaneous.....	18,400.64	18,784.62		383.98
Total	535,036.59	573,957.43		38,920.84
EXPENSES.				
Maintenance of way and structures.....	68,819.71			
Maintenance of equipment	32,141.69			
Conducting transportation	173,941.68			
General expenses and taxes	50,469.38			
Total	325,372.46	347,984.43		22,611.97
Net earnings	209,664.13	225,973.00		16,308.87
Average miles operated	107.42	107.42		
Earnings per mile	\$4,980.79	\$5,343.11		362.32
Expenses per mile	3,028.97	3,239.47		210.50
Net earnings per mile	1,951.82	2,103.64		151.82
Percentage of expenses to earnings.....	60.81	60.62	\$0.19	

CENTRAL BRANCH UNION PACIFIC RAILROAD COMPANY.

The subsidized portion of this road extends from Atchison to Water-ville, Kans., a distance of 100 miles. The company also leases the Atchison, Colorado and Pacific Railroad, 254.03 miles, and the Atchison, Jewell County and Western Railroad, 34 miles, making a total of 388.03 miles. The Union Pacific Railway Company owns \$858,800 of the capital stock of the company, but the road and its branches were leased to the Missouri Pacific Railway Company September 30, 1885, for a period of twenty-five years.

The subsidy bonds issued to aid in the construction of this road amounted to \$1,600,000. The interest paid on these bonds by the United States amounted to \$2,221,808.26, and there had been repaid by the company in transportation services and cash, the sum of \$133,704.68, leaving a liability to the Government on June 30, 1890, of \$3,388,103.58. The excess of interest paid over all credits amounted to \$1,788,103.58.

During the year 29,400 new cross-ties were placed in the track at a cost of \$11,822.85. The equipment consists of 35 locomotives, 11 of which are equipped with Westinghouse air and 5 with steam brakes, 23 cars in the passenger service, all equipped with Westinghouse brakes and Miller platforms, and 524 cars in the freight service.

The records of the General Land Office show that to June 30, 1890, there had been patented to this company 218,250.03 acres of land. The report of the company states that the receipts of the land department during the year amounted to \$7,567.99, and that there were outstanding on account of time sales \$25,367.52.

The bonded portion of the road was inspected by the engineer of this Bureau in June and found to be in very good condition. His report thereon will be found in Appendix No. 1.

The following statements show the financial condition of the company June 30, 1890:

Financial condition of the Central Branch Union Pacific Railroad Company June 30, 1890

LIABILITIES.

First-mortgage bonds	\$2,230,000.00
Interest on same, due and accrued	2,195.00
United States subsidy bonds	1,600,000.00
Interest on same paid by United States	2,221,808.26
Dividends unpaid	25.00
Accounts payable	630,020.03
Total debt	6,693,048.29
Capital stock	1,000,000.00
Total stock and debt	7,693,048.29

ASSETS.

Road, fixtures, and equipment	\$4,001,163.51
Land contracts, land cash, etc.	25,367.52
Company's stocks and bonds owned by company	16,400.00
Other stocks and bonds	112,837.76
Accounts receivable	47,897.84
Repaid the United States in transportation and cash.	444,465.25
Total assets	4,647,191.88
Deficit	3,045,856.41

REPORT OF THE SECRETARY OF THE INTERIOR. 521

Revenue and expenditures for year ending June 30, 1890.

REVENUE.

Earnings.....	\$562,440.41
Interest on bonds of other companies.....	225.00
Interest and income from miscellaneous investments.....	7,382.04
Receipts of the land department.....	1,762.01
Total.....	571,809.46

EXPENDITURES.

Operating expenses and taxes.....	\$347,347.36
Interest on first mortgage bonds.....	140,100.00
Losses on leased lines.....	468,276.65
Expenses of the land department.....	102.54
United States requirement.....	14,628.49
Profit and loss.....	5,900.49
Total.....	976,355.69
Deficit.....	404,546.23

Comparative statement of the earnings and expenses of the Central Branch Union Pacific Railroad Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger.....	\$73,100.24	\$81,388.12		\$8,287.88
Freight.....	468,041.81	296,175.34	\$168,866.47	
Mail.....	14,401.32	14,401.32		
Express.....	4,824.99	5,276.90		451.91
Miscellaneous.....	7,072.05	8,832.69		1,760.64
Total.....	562,440.41	406,074.37	156,366.04	
EXPENSES.				
Maintenance of way and structures.....	65,966.79	58,742.36	12,224.43	
Maintenance of equipment.....	45,786.76	45,016.88	769.88	
Conducting transportation.....	178,705.26	129,902.92	48,802.33	
General expenses.....	31,213.14	26,740.70	4,463.44	
Total.....	321,731.94	255,411.86	66,320.08	
Net earnings.....	240,708.47	150,662.51	90,045.96	
Average miles operated.....	100	100		
Earnings per mile.....	\$5,624.40	\$4,060.74	\$1,563.66	
Expenses per mile.....	3,217.32	2,554.12	663.20	
Net earnings per mile.....	2,407.08	1,506.62	900.46	
Percentage of expenses to earnings.....	57.20	62.80		5.60

Statement of amount found due for year ending December 31, 1889.

EARNINGS.

United States:		
Passenger.....		\$222.70
Freight.....		10.23
Mail.....		14,401.32
		14,634.25
Commercial:		
Passenger.....	\$70,111.94	
Freight.....	336,462.85	
Express.....	4,761.73	
Miscellaneous.....	7,361.98	
		418,698.40
Total earnings.....		433,332.65

Statement of amount found due for year ending December 31, 1889—Continued.

EXPENSES.	
Conducting transportation	\$83,683.61
Motive power	84,764.06
Maintenance of way	52,251.13
Maintenance of cars	26,640.85
General expenses and taxes	39,736.76
Total expenses	\$287,102.01
Net earnings	146,230.64
Five per cent. of net earnings	7,311.53
DUE THE UNITED STATES.	
One-half Government transportation, as above	7,317.19
Five per cent. of net earnings	7,311.53
Total	14,628.65

The following statements show the number of miles which have been aided, the date of issue of bonds, date of commencement of interest, date of maturity of bonds, amount of principal which the several Pacific railroads have received from the United States, and the amount of interest to maturity:

UNION PACIFIC RAILROAD COMPANY.

Miles.	Date of issue of bonds.	Date of commencement of interest.	Date of maturity of bonds.	Amount of principal.
40	Feb. 1, 1866	Feb. 1, 1866	Feb. 1, 1890	\$640,000.00
25	May 7, 1866	May 7, 1866		400,000.00
40	June 20, 1866	June 20, 1866		640,000.00
20	July 13, 1866	July 13, 1866		320,000.00
35	Aug. 9, 1866	Aug. 9, 1866		560,000.00
45	Sept. 11, 1866	Sept. 11, 1866		720,000.00
35	Oct. 13, 1866	Oct. 13, 1866		560,000.00
30	Nov. 8, 1866	Nov. 7, 1866		480,000.00
35	Jan. 9, 1867	Jan. 8, 1867	Jan. 1, 1897	560,000.00
40	June 11, 1867	June 10, 1867		640,000.00
40	July 6, 1867	July 6, 1867		640,000.00
35	Aug. 29, 1867	Aug. 29, 1867		560,000.00
35	Oct. 2, 1867	Oct. 2, 1867		560,000.00
35	Nov. 5, 1867	Nov. 5, 1867		560,000.00
20	Dec. 13, 1867	Dec. 13, 1867		320,000.00
30	Jan. 26, 1868	Jan. 27, 1868	Jan. 1, 1898	480,000.00
20	May 18, 1868	May 16, 1868		320,000.00
20	May 19, 1868	May 13, 1868		320,000.00
20	June 12, 1868	June 12, 1868		320,000.00
20	June 17, 1868	June 18, 1868		320,000.00
20	July 23, 1868	July 22, 1868		320,000.00
40	July 25, 1868	July 24, 1868		640,000.00
20	Aug. 12, 1868	Aug. 11, 1868		320,000.00
20	Aug. 29, 1868	Aug. 28, 1868		320,000.00
40	Sept. 7, 1868	Sept. 7, 1868		640,000.00
20	Sept. 23, 1868	Sept. 23, 1868		320,000.00
20	Oct. 22, 1868	Oct. 21, 1868		320,000.00
20	Nov. 20, 1868	Nov. 19, 1868		320,000.00
40	Dec. 7, 1868	Dec. 7, 1868		640,000.00
20	Dec. 15, 1868	Dec. 14, 1868		320,000.00
20	Dec. 17, 1868	Dec. 16, 1868		320,000.00
20	Dec. 24, 1868	Dec. 23, 1868		320,000.00
20	Dec. 24, 1868	Dec. 24, 1868		320,000.00
20	July 15, 1870	Nov. 21, 1869	Jan. 1, 1890	1,512.00
20	Jan. 20, 1869	Jan. 20, 1869		320,000.00
40	Feb. 10, 1869	Feb. 10, 1869		640,000.00
20	July 22, 1869	July 16, 1869		320,000.00
13.68	Nov. 10, 1869	July 16, 1869		437,000.00
5	July 14, 1870	July 16, 1869		160,000.00
1038.68	Total			27,236,512.00
	Interest to maturity at 6 per cent			48,115,835.85
	Total principal and interest			75,352,347.85

KANSAS PACIFIC RAILWAY COMPANY.

Miles.	Date of issue of bonds.	Date of commencement of interest.	Date of maturity of bonds.	Amount of principal.
40	Nov. 1, 1885	Nov. 1, 1885	Nov. 1, 1895	\$540,000.00
22	Jan. 1, 1886	Jan. 1, 1886	Jan. 1, 1896	352,000.00
23	May 8, 1886	May 8, 1886		368,000.00
20	July 9, 1886	July 9, 1886		320,000.00
25	Oct. 16, 1886	Oct. 15, 1886		400,000.00
25	Jan. 23, 1887	Jan. 23, 1887	Jan. 1, 1897	400,000.00
30	May 6, 1887	May 6, 1887		480,000.00
25	June 11, 1887	June 10, 1887		400,000.00
24	Aug. 13, 1887	Aug. 13, 1887		384,000.00
25	Sept. 20, 1887	Sept. 20, 1887		400,000.00
26	Oct. 26, 1887	Oct. 26, 1887		416,000.00
20	Dec. 3, 1887	Dec. 3, 1887		320,000.00
30	Jan. 14, 1888	Jan. 14, 1888	Jan. 1, 1898	480,000.00
25	Apr. 28, 1888	Apr. 28, 1888		400,000.00
20	June 6, 1888	June 6, 1888		320,000.00
13.9425	Nov. 5, 1888	Nov. 2, 1888		223,000.00
893.9425	Total			6,303,000.00
	Interest to maturity at 6 per cent.			11,188,943.09
	Total principal and interest			17,491,943.09

CENTRAL BRANCH UNION PACIFIC RAILROAD COMPANY.

20	July 27, 1886	July 19, 1886	Jan. 1, 1896	\$320,000.00
20	Dec. 7, 1886	Dec. 6, 1886		370,000.00
20	May 2, 1887	May 1, 1887	Jan. 1, 1897	320,000.00
20	Dec. 4, 1887	Dec. 3, 1887		320,000.00
20	Jan. 21, 1888	Jan. 20, 1888	Jan. 1, 1898	320,000.00
100	Total			1,600,000.00
	Interest to maturity at 6 per cent.			2,826,608.26
	Total principal and interest			4,426,608.26

CENTRAL PACIFIC RAILROAD COMPANY.

31	May 12, 1863	Jan. 16, 1865	Jan. 16, 1895	\$1,258,000.00
	Nov. 6, 1865	Aug. 13, 1865		384,000.00
23	Nov. 9, 1865	Oct. 16, 1865		256,000.00
	Dec. 11, 1865	Nov. 29, 1865		464,000.00
20	Mar. 6, 1866	Mar. 6, 1866	Jan. 1, 1896	640,000.00
20	July 10, 1866	July 10, 1866		640,000.00
	Oct. 31, 1866	Oct. 29, 1866		320,000.00
20	Jan. 15, 1867	Jan. 14, 1867	Jan. 1, 1897	640,000.00
	Oct. 25, 1867	Oct. 25, 1867		320,000.00
24	Dec. 12, 1867	Dec. 11, 1867		1,152,000.00
20	June 10, 1868	June 9, 1868	Jan. 1, 1898	948,000.00
	July 11, 1868	July 10, 1868		320,000.00
20	Aug. 5, 1868	Aug. 4, 1868		640,000.00
37	Aug. 14, 1868	Aug. 13, 1868		1,184,000.00
40	Sept. 12, 1868	Sept. 11, 1868		1,280,000.00
35	Sept. 21, 1868	Sept. 19, 1868		1,120,000.00
40	Oct. 13, 1868	Oct. 12, 1868		1,280,000.00
20	Oct. 28, 1868	Oct. 26, 1868		640,000.00
20	Nov. 5, 1868	Nov. 3, 1868		640,000.00
20	Nov. 12, 1868	Nov. 11, 1868		640,000.00
20	Dec. 5, 1868	Dec. 5, 1868		640,000.00
20	Dec. 7, 1868	Dec. 7, 1868		640,000.00
20	Dec. 30, 1868	Dec. 29, 1868		640,000.00
	Jan. 2, 1872	Nov. 28, 1868		4,120.00
20	Jan. 15, 1869	Jan. 13, 1869	Jan. 1, 1899	640,000.00
20	Jan. 29, 1869	Jan. 28, 1869		640,000.00
20	Feb. 17, 1869	Feb. 17, 1869		640,000.00
20	Mar. 2, 1869	Feb. 17, 1869		1,064,000.00
20	Mar. 2, 1869	Mar. 2, 1869		1,336,000.00
20	May 26, 1869	May 27, 1869		1,786,000.00
100	July 15, 1869	May 27, 1869		1,314,000.00
20.30	July 16, 1869	July 15, 1869		268,000.00
47.20	Dec. 13, 1869	July 16, 1869		1,510,000.00
737.50	Total			23,885,120.00
	Interest to maturity at 6 per cent.			45,786,454.67
	Total principal and interest			71,671,574.67

PAPERS ACCOMPANYING THE

WESTERN PACIFIC RAILROAD COMPANY.

Miles.	Date of issue of bonds.	Date of commencement of interest.	Date of maturity of bonds.	Amount of principal.
20	Jan. 24, 1867	Jan. 26, 1867	Jan. 1, 1897	\$350,000.00
20	Sept. 3, 1869	Sept. 3, 1869	Jan. 1, 1899	320,000.00
63	Oct. 29, 1869	Oct. 28, 1869		1,000,000.00
20.18	Jan. 27, 1870	Jan. 22, 1870		322,000.00
	Jan. 8, 1872	Jan. 22, 1870		500.00
123.18	Total			1,970,500.00
	Interest to maturity at 6 per cent.			2,482,402.74
	Total principal and interest			5,453,002.74

SIOUX CITY AND PACIFIC RAILROAD COMPANY.

49.50	Mar. 16, 1868	Mar. 16, 1868	Jan. 1, 1896	\$792,000.00
20	Mar. 30, 1868	Mar. 30, 1868		320,000.00
22.27	Mar. 3, 1869	Mar. 3, 1869		614,320.00
101.77	Total			1,726,320.00
	Interest to maturity at 6 per cent.			2,680,503.89
	Total principal and interest			4,406,823.89

Amount of bonds issued in aid of Pacific Railroads, the interest paid thereon by the United States, and the amounts repaid by the several companies to June 30, 1890.

	Union Pacific, including Kansas Pacific.	Central Pacific, including Western Pacific.	Sioux City and Pacific.	Central Branch Union Pacific.	Total.
Principal of bonds issued by the United States	\$33,639,512.00	\$27,855,680.00	\$1,028,320.00	41,600,000.00	\$64,623,512.00
Interest paid thereon by the United States	45,173,778.54	36,820,189.81	2,148,191.89	2,221,806.26	86,363,066.50
Total debt	78,813,290.54	64,675,869.81	3,176,511.89	3,821,806.26	150,487,488.50
CREDITS.					
Applied to bond and interest account:					
Transportation	16,143,460.60	6,076,668.54	163,047.16	426,777.77	22,810,944.66
Cash	438,409.68	653,282.26		6,920.91	1,103,612.75
Applied to sinking fund account:					
Transportation	7,385,265.22	3,125,983.42			10,511,248.64
Cash	1,421,714.46	639,992.46			2,061,706.91
Interest on sinking fund					
Investments	1,609,682.12	855,176.72			2,464,858.84
Total credits	26,969,727.97	11,342,104.42	163,047.16	433,704.68	38,943,584.23
Balance of debt	51,843,562.57	53,333,765.39	3,013,464.73	3,388,101.58	112,043,896.27
Excess of interest paid by the United States over all credits	18,178,050.57	26,471,095.39	1,953,144.73	1,788,103.68	47,426,394.27

ATCHISON, TOPEKA AND SANTA FÉ RAILROAD COMPANY.

This company has failed to submit any report of its operations for the fiscal year ending June 30, 1890.

ATLANTIC AND PACIFIC RAILROAD COMPANY.

The road operated by this company June 30, 1890, was as follows:

Western Division:	Miles.
Albuquerque, N. Mex., to Mojave, Cal.	815.49
Branch, Gallup to coal mines.	3.39
Total	818.79

The central division, from Seneca, Mo., to Supulpa, Ind. T., 112.05 miles in length, is owned by this company, but is operated by the St. Louis and San Francisco Railway Company. The entire line is laid with steel rails. The ballast consists of 31 miles of gravel, 89.60 miles of cinder, and the remainder of earth. There were placed in the track during the year 230,495 cross-ties, at a cost of \$121,460.91. The sum of \$40,220.83 was expended during the same period for additions and betterments to railway, and \$109,715.59 for new equipment.

The equipment consists of 49 locomotives, all equipped with Westinghouse brakes; 21 cars in passenger service, all equipped with Westinghouse brakes and Miller platforms; 1,246 cars in freight service, 69 of which have Westinghouse brakes; and 193 cars in road-repair service, including hand and push cars.

The records of the General Land Office show that there had been patented to this company to June 30, 1890, in Missouri, 728,949.36 acres of land, and in California, Arizona, and New Mexico, 959,246.87 acres, making a total of 1,688,196.23 acres. The report of the company states that since the reorganization the total cash receipts from all sales of land to date amounted to \$3,744,076.65, and that there are outstanding, on account of time sales, \$436,915.83. The total number of acres disposed of is not stated.

The following statements show the financial condition of the company June 30, 1890:

Financial condition of the Atlantic and Pacific Railroad Company, June 30, 1890.

LIABILITIES.

First-mortgage bonds	\$18,793,905.00
Interest on same, due and accrued	362,230.00
Interest on same accrued, not due	11,895.00
Other funded debt	20,219,629.00
Interest on same due and unpaid	450.00
Interest on same and rental accrued, not due	221,066.50
Bills payable	7,308,819.25
Accounts payable	121,762.63
Pay rolls and vouchers	331,374.31
Due other companies on account of traffic	36,203.83
Sinking funds uninvested	33,333.33
Interest on unfunded debt, accrued	1,315,948.41
Total debt	48,756,617.26
Capital stock	79,760,300.00
Total stock and debt	128,516,917.26

ASSETS.

Road, fixtures, and equipment	\$119,993,378.30
Land contracts, land cash, etc.	562,989.15
Fuel, material, and stores on hand	170,232.35
Cash on hand	407,252.42
Bills receivable	28,449.63
Accounts receivable	463,360.64
Due from other companies on account of traffic	127,227.54
Due from the United States	41,098.10
Suspense accounts	83,077.92
Total assets	121,882,066.05
Deficit	6,634,851.21

Revenue and expenditures for the year ending June 30, 1890.

REVENUE.

Earnings	\$2, 210, 481.35
Interest on miscellaneous investments	168.80
Receipts of the land department	3, 380, 222.98
Total	6, 146, 733.13

EXPENDITURES.

Operating expenses	\$2, 097, 837.33
Interest on first-mortgage bonds	774, 530.00
Interest on other funded debt	330, 000.00
Interest on other debt	1, 042, 223.67
Sinking fund requirements, company	33, 343.33
New construction	40, 220.83
New equipment	109, 715.59
Expenses of the land department	221, 725.40
Total	6, 196, 586.35
Deficit	49, 853.22

Comparative statement of the earnings and expenses of the Atlantic and Pacific Railroad Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger	\$576, 929.17	\$869, 324.67		\$232, 395.70
Freight	1, 032, 300.81	1, 944, 830.62		12, 538.61
Mail	83, 002.08	85, 953.10		2, 896.62
Express	128, 415.06	169, 661.04		41, 245.98
Miscellaneous	9, 436.50	9, 289.73	\$146.77	
Total	2, 730, 144.52	2, 049, 094.26		289, 049.74
EXPENSES.				
Maintenance of way and structures	524, 694.56	1, 050, 998.06		536, 104.56
Maintenance of equipment	349, 893.72	351, 241.44		1, 417.72
Conducting transportation	1, 244, 133.54	1, 337, 565.65	6, 647.89	
General expenses and taxes	87, 086.80	90, 409.16		2, 782.00
Total	2, 206, 548.68	2, 840, 305.91		533, 757.23
Net earnings	429, 595.84	178, 788.35	244, 807.49	
Average miles operated	815.00	815.00		
Earnings per mile	\$3, 349.20	\$3, 794.40		\$354.54
Expenses per mile	2, 839.12	3, 485.03		654.91
Net earnings per mile	\$19.74	\$219.37	300.37	
Percentage of expenses to earnings	84.48	94.07		9.59

CHICAGO, BURLINGTON AND QUINCY RAILROAD COMPANY.

The number of miles of road owned and leased by this company December 31, 1889, including all branches, was 4,969.53. It also leases and operates jointly with other companies and roads, for which a yearly rental is paid, 171.28 miles, making a total of 5,140.81 miles operated. There were added during the year 223.54 miles of road. There are 294 miles of second track and 23.70 miles of third track. The main

line extends from Chicago, Ill., via Pacific Junction to Denver, Colo., a distance of 1,024.20 miles.

The properties controlled by this company, but whose operations are not included in its report, consist of 1,115 miles of standard-gauge and 169 miles of narrow-gauge railroad owned, and 95 miles of standard-gauge railroad leased and operated jointly with other companies.

The expenditures for construction during the year amounted to \$3,128,834.60, and for new equipment to \$796,911.98.

The equipment consisted of 709 locomotives; 357 passenger and combination, 134 baggage, mail, and express, 7 dining, 11 officers', 352 way, 15 boarding, 8 wrecking, 21,018 box and cattle, 5,711 platform and coal, 5 pile-driving, 1,444 hand, 1,064 rubble and iron cars, making a total of 30,126 cars of all descriptions. There were added during the year 20 locomotives; 3 passenger and combination, 888 box and cattle, 112 platform and coal, 15 hand, and 55 rubble and iron cars.

The records of the General Land Office show that there had been patented to the Burlington and Missouri River Railroad companies in Iowa and Nebraska, 2,762,304.85 acres of land, but the report of the company does not show what disposition has been made of it nor the amount realized thereon. The company reports the operations of its land department for the year as follows: Cash received during the year, \$448,646.59, and outstanding on account of time sales, \$997,234.70. It still owns 69,360 acres of land at an estimated value of \$315,100.00.

The engineer of this Bureau inspected that portion of the Burlington and Missouri River Railroad in Nebraska between Plattsmouth and Hastings, and found it in very good condition. His report thereon will be found in Appendix No. 1.

The following statements show the financial condition of the company, June 30, 1890:

Financial condition of the Chicago, Burlington and Quincy Railroad Company, June 30, 1890.

LIABILITIES.

Funded debt.....	\$101,707,486.86
Contingent liabilities of branch roads.....	5,330,780.84
Coupon interest unpaid.....	1,130,274.00
Pay rolls and vouchers.....	946,710.78
Sundry current accounts.....	1,709,321.35
Profit and loss.....	6,443,678.35
Renewal fund.....	2,000,000.00
Sinking funds, company.....	16,792,168.60
Total debt.....	144,180,420.78
Capital stock.....	76,394,505.00
Total stock and debt.....	220,574,925.78

ASSETS.

Road and equipment.....	\$180,898,136.46
Investments in branch securities.....	28,968,142.99
Sundry investments.....	962,358.12
Materials and stores on hand.....	1,456,306.14
Sinking funds in hands of trustees.....	13,042,689.02
Sundry available securities.....	622,900.00
Accounts and bills receivable.....	3,636,394.09
Cash on hand.....	1,132,037.24
Total assets.....	220,663,564.06
Surplus.....	10,088,638.28

Statement of earnings and expenses for the year ending June 30, 1890.

EARNINGS.

Passenger	\$6,155,219.72
Freight	19,608,601.81
Mail, express, and miscellaneous	2,384,537.22
Total	28,238,424.92

EXPENSES.

Operating expenses, not including taxes	\$17,306,244.80
Surplus	10,932,180.12

CHICAGO AND NORTHWESTERN RAILWAY COMPANY.

The lines of railway which make up the system of this company are as follows:

	Miles.
Chicago and Northwestern Railway	2,676.72
Dakota Central Railway	723.93
Toledo and Northwestern Railway	385.19
Princeton and Western Railway	16.06
Winona and St. Peter Railroad	448.48
Total	4,250.38

In addition to the above, there are 137.71 miles of double track, and 1,023 miles of sidings. There are 4,526.18 miles of track laid with steel rails, and 880.77 miles laid with iron rails. The ballast consists of 126.57 miles of stone and slag, 1,336.55 miles of gravel, 91 miles of cinder, and 3,852.83 miles of earth. There are 3,434.88 miles of fencing.

During the year there were laid 18,585 tons of steel rails at a cost of \$563,884.60, and 1,368,571 cross ties were placed in the track at a cost of \$500,131.17.

Numerous improvements and additions were made during the year, the principal one being the completion of a large and well arranged passenger station at Milwaukee, Wis. The construction of a second main track on the Galena division was continued during the year, the sum of \$473,018.96 being expended on this work. It is expected that the remainder of the second track between Chicago and the Mississippi River will be completed during the ensuing fall. New side tracks aggregating 77.88 miles were constructed at various places upon the several divisions of the road, at a cost of \$420,596.23. The total expenditure for additions and betterments to the railway amounted to \$1,816,279.10.

The equipment consists of 806 locomotives equipped with Westinghouse brakes; 11 parlor, 9 dining, 6 chair, 8 officers', 302 first-class and 28 second-class passenger, 28 mail, 117 baggage and express, and 49 combination cars, making a total of 558 cars in the passenger service, all of which are equipped with Westinghouse brakes and patent platforms. In the freight service there are 14,949 box, 1,861 stock, 1,950 coal, 2,197 flat, 4,651 ore, 156 refrigerator, 29 milk, and 451 caboose cars, making a total of 26,244 cars in this department. In the road-repair service there are 25 dump, 82 ditching, 29 pile-driving and wrecking cars, and 2 rotary steam plows. There were added during the year 20 locomotives, 6 chair, 5 milk, 2 mail, 16 refrigerator, 501 box, and 500 ore cars, at a total cost of \$891,188.68.

The company reports that the total number of acres of land acquired under the several grants was 2,959,105.20, of which 1,804,892.26 had

been sold and conveyed by deed and 241,456.46 were under contract, leaving 912,756.47 acres still owned by the company. The total cash receipts from all sales to June 30, 1890, amounted to \$5,873,719.53, and there remained outstanding on account of time sales the sum of \$771,100.77.

The main line of the road between Chicago and Omaha was inspected by the engineer of this Bureau in August and found to be in excellent condition. His report thereon will be found in Appendix No. 1.

The following statements show the financial condition of the company on June 30, 1890:

Financial condition of the Chicago and Northwestern Railway Company, June 30, 1890.

LIABILITIES.

First-mortgage bonds	\$78,880,500.00
Interest on same, due and unpaid	144,266.50
Interest on same, accrued, not due	1,200,323.18
Other funded debt	26,105,000.00
Interest on same, due and unpaid	73,377.52
Interest on same, accrued, not due	187,279.14
Dividends unpaid	89,508.75
Pay-rolls and vouchers	2,081,875.35
Due other companies on account of traffic	265,272.61
Due other companies on account of leases	6,000.00
Sinking funds paid	4,747,970.00
Land notes due in 1891	125,000.00
Fremont, Elkhorn and Missouri Valley R. R. Co.	1,038,775.00
Total debt	114,945,148.05
Subscription account, stock of Paint River Railway Company	375.00
Capital stock	66,532,820.53
Total stock and debt	181,478,343.58

ASSETS.

Cost of road, fixtures, and equipment	\$155,328,469.99
Cost of real estate, other than road	552,478.40
Land contracts, land cash, etc.	422,793.75
Fuel, materials, and stores on hand	2,071,297.20
Cash on hand	636,420.57
Company's stocks and bonds owned by company	268,875.00
Other stocks and bonds	23,102,552.39
Sinking fund in hands of trustees, company	4,747,970.00
Bills receivable	26,736.80
Accounts receivable	1,833,767.83
Total assets	188,991,781.93
Surplus	7,513,438.35

Revenue and expenditures.

REVENUE.

Earnings	\$27,421,193.46
Dividends on stocks of other companies	285,243.00
Interest on bonds of other companies	458.34
Interest on miscellaneous investments	124,178.36
Receipts of the land department	509,563.32
Total	28,340,636.48

Revenue and expenditures—Continued.

EXPENDITURES.	
Operating expenses	\$17,801,911.29
Interest on first-mortgage bonds	4,356,338.38
Interest on other funded debt	1,547,379.00
Sinking-fund requirements, company	202,670.00
New construction	1,816,279.10
New equipment	891,188.68
Dividends 63, 64, 65, preferred; 31, 32, common	3,441,979.00
Expenses of the land department	139,028.94
Total	30,089,645.90
Deficit	1,730,009.51

CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY COMPANY.

This company has not submitted its report for the fiscal year ending June 30, 1890, on the form prescribed by this office, monthly statements of earnings and expenses being all that have been furnished.

The following information is compiled from the printed annual report of the company to its stockholders for the year ending March 31, 1890:

The main line of the road extends from Chicago, Ill., to Council Bluffs, Iowa, a distance of 499.20 miles. The Kansas branch extends from Davenport, Iowa, to Atchison, Kans., 342.40 miles, and the Leavenworth branch from Atchison Junction to Leavenworth, Kans., 21.50 miles. It also has various other branches, aggregating 322.70 miles in length, which makes a total of road owned of 1,155.80 miles. The company also leases 1,823.44 miles of road and has trackage rights over 330.30 miles, making a total of 3,339.54 miles of road over which trains are operated.

The amount charged to construction and equipment account for the year was \$1,013,133.96.

The equipment consists of 521 locomotives, 36 sleeping, 236 passenger, 74 baggage, mail, and express, 9 postal, 11 dining, and 5 officers' cars, making a total of 371 cars in passenger service. In freight service there are 9,585 box, 1,852 stock, 2,429 platform and coal, and 390 drivers, caboose, and other cars, making a total of 14,256 cars in this service. There are 1,327 gravel, hand, and other cars used in road-repair service. Additional equipment had been purchased as follows: Ten locomotives, 650 box, 35 furniture, 3 dining, and 2 caboose cars.

The records of the General Land Office show that to June 30, 1890, there had been patented by the Government 1,212,569.45 acres of land, 643,147.17 being on account of the grant to the Chicago, Rock Island and Pacific Railway and 569,422.28 on account of the Des Moines Valley Railroad, but the company has failed to report what disposition has been made of the same and the amount realized thereon. The land commissioner of the company reports that for the year ending March 31, 1890, there had been sold 3,039.10 acres for \$34,187.36. The bills receivable outstanding at the close of the year amounted to \$221,951.32, and the interest and rental collected to \$19,310.36. The number of acres remaining unsold was 6,029.80, besides many lots in the town of Audobon.

The following statement shows the liabilities and assets of the company April 1, 1890:

REPORT OF THE SECRETARY OF THE INTERIOR. 531

Financial condition of the Chicago, Rock Island and Pacific Railway Company, April 1, 1890.

LIABILITIES.

Six per cent. mortgage bonds.....	\$12,500,000.00
Five per cent. extension bonds.....	32,387,000.00
Chicago and Southwestern Railway bonds, guarantied.....	5,000,000.00
Addition and improvement account	8,213,000.00
Accounts payable.....	1,163,255.64
Total debt.....	59,163,255.64
Capital stock	46,156,000.00
Total stock and debt.....	105,319,255.64

ASSETS.

Road, fixtures, and equipment.....	\$65,486,393.13
Railroad bridge at Rock Island.....	758,526.10
Stocks and bonds of connecting roads	8,714,022.45
Company's stock owned by company	12,100.00
Company's 6 per cent. bonds owned by company.....	400,000.00
Advances to Chicago, Kansas and Nebraska Railway Company	28,134,396.81
Loans and other investments.....	595,644.18
Fuel, materials, and stores on hand	806,544.90
Accounts receivable.....	760,723.85
Cash and loans (payable on demand)	160,200.79
Total assets.....	106,836,552.21
Surplus.....	517,296.57

Comparative statement of the earnings and expenses of the Chicago, Rock Island and Pacific Railway Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger	\$4,525,901.58	\$3,668,560.33	\$857,335.25	
Freight.....	12,593,175.70	8,773,828.38	3,519,347.32	
Mail.....	372,602.87	251,113.52	121,489.35	
Express	313,906.59	250,524.27	63,382.32	
Miscellaneous	537,931.11	561,648.32		\$23,717.21
Total	18,043,517.85	13,505,680.82	4,537,837.03	
EXPENSES.				
Maintenance of way and structures	2,572,106.21	1,802,119.61	679,986.60	
Maintenance of equipment	2,107,817.57	2,004,728.63	103,118.94	
Conducting transportation	5,818,799.66	4,206,122.87	1,612,676.69	
General expenses and taxes	2,217,779.14	1,494,186.05	723,593.09	
Total	12,746,533.48	9,597,157.16	3,149,376.32	
Net earnings	5,296,984.37	3,908,523.66	1,388,460.71	
Average miles operated	3,257.00	1,976.13	1,280.87	
Earnings per mile	\$5,539.92	\$6,834.40		\$1,294.48
Expenses per mile	3,913.58	4,856.54		942.96
Net earnings per mile	1,626.34	1,977.86		351.52
Percentage of expenses to earnings.....	70.60	71.06		.46

DUBUQUE AND SIOUX CITY RAILROAD COMPANY.

The main line of this road extends from Dubuque to Sioux City, Iowa, a distance of 326.58 miles. The company also owns 273.01 miles of branch lines, making a total of 599.59 miles operated, of which 520 miles are laid with steel rails.

The Dubuque and Pacific Railroad Company was chartered November 24, 1856, for the purpose of constructing a line between Dubuque and Iowa Falls, Iowa, a distance of 142.89 miles. After the completion of 80 miles of road it was sold under foreclosure August 21, 1860, and the company reorganized under the name of the Dubuque and Sioux City Railroad Company.

The Iowa Falls and Sioux City Railroad Company was organized October 1, 1867, for the purpose of constructing a road from Iowa Falls to Sioux City, Iowa, a distance of 183.69 miles. Both companies received grants of land from the United States to aid in their construction.

On October 3, 1889, the following-named roads were conveyed to the Dubuque and Sioux City Railroad Company :

	MILES
Dubuque and Sioux City Railroad, Dubuque to Iowa Falls	142.89
Iowa Falls and Sioux City Railroad, Iowa Falls to Sioux City	183.69
Cedar Rapids and Chicago Railroad, Manchester to Cedar Rapids.....	41.85
Cherokee and Dakota Railroad :	
Cherokee to Sioux Falls.....	96.48
Cherokee to Onawa.....	59.10

The capital stock was increased to \$8,000,000, all of which is outstanding except the sum of \$400.

The entire road is operated by the Illinois Central Railroad Company.

The equipment consists of 55 locomotives, 21 of which are equipped with Westinghouse brakes; 26 first-class and 19 combination cars equipped with Westinghouse brakes and Miller platforms; 137 box, 24 stock, 14 coal, 24 flat, and 7 caboose cars, making a total of 251 cars in service.

The expenditures during the year ending June 30, 1890, for additions and betterments to railway amounted to \$116,007.67, all of which was charged to construction account.

The records of the General Land Office show that to June 30, 1890, there had been patented by the Government to aid in the construction of a railroad between Dubuque and Sioux City, Iowa, 1,233,491.75 acres of land, the Dubuque and Sioux City Railroad Company having received 550,467.95 acres, and the Iowa Falls and Sioux City Railroad Company 683,023.80 acres.

In its report to this office the transactions of the land department are given by the company only for the fiscal year ending June 30, 1890, the total receipts being stated as \$6,957.73, and the expenses \$1,095.80, whilst there remained outstanding on account of time sales the sum of \$7,710. The report fails to show the total number of acres which have been disposed of from the grant, and the amount received therefor.

The following statements are compiled from the company's report to this office :

REPORT OF THE SECRETARY OF THE INTERIOR. 533

Financial condition of the Dubuque and Sioux City Railroad Company June 30, 1890.

LIABILITIES.

First-mortgage bonds.....	\$8,611,000.00
Interest on same, due and accrued	29,312.50
Interest on same, accrued, not due.....	70,770.83
Dividends unpaid.....	499.23
Bills payable.....	320,000.00
Pay rolls, vouchers, and accounts.....	713.49
Due other companies on account of traffic.....	257,071.03
Total debt.....	9,289,367.08
Capital stock.....	7,999,600.00
Total stock and debt.....	17,288,967.08

ASSETS.

Cost of road and fixtures	\$16,703,501.07
Cost of real estate, other than road	24,616.88
Land contracts	7,710.00
Company's stocks and bonds owned by company.....	541,493.13
Other stocks and bonds.....	300.00
Accounts receivable	9,943.82
Total assets.....	17,287,564.90
Deficit	1,402.18

Revenue and expenditures for the year ending June 30, 1890.

REVENUE.

Earnings	\$1,733,522.17
Dividends on stocks of other companies	24.00
Interest on bonds of other companies	23,025.00
Receipts of the land department	6,957.73
Total	1,763,528.90

EXPENDITURES.

Operating expenses	\$1,203,365.32
Interest on first-mortgage bonds.....	498,270.00
Interest on other debt.....	14,568.90
Expenses of the land department.....	1,695.80
Rental leased road, paid into court to abide decision of court, July 1, 1889, to June 30, 1890	113,370.00
Total	1,831,270.02
Deficit.....	67,741.12

Comparative statement of the earnings and expenses of the Dubuque and Sioux City Railroad Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger.....	\$446,741.59	\$426,622.30	\$20,119.29	
Freight.....	1,171,788.62	1,055,033.95	116,734.67	
Mail.....	40,099.97	39,532.30	567.67	
Express.....	25,650.62	25,432.55	218.07	
Miscellaneous.....	40,261.37	35,746.25	13,505.12	
Total	1,733,522.17	1,582,377.35	151,144.82	

Comparative statement of the earnings and expenses of the Dubuque and Sioux City Railroad Company—Continued.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EXPENSES.				
Maintenance of way and structures.....	\$495,601.31	\$369,292.37	\$126,308.94	
Maintenance of equipment.....	179,324.44	150,808.11	28,516.33	
Conducting transportation.....	549,955.94	519,459.14	30,496.80	
General expenses and taxes.....	180,117.90	168,578.01	11,539.89	62,789.71
Total.....	1,314,972.59	1,208,138.63	106,833.96	
Net earnings.....	414,149.18	354,094.12	60,055.06	
Average miles operated.....	326.53	326.53		
Earnings per mile.....	5,894.10	4,845.39	1,048.71	
Expenses per mile.....	4,099.63	3,761.22	338.41	
Net earnings per mile.....	1,794.47	1,084.17	710.30	
Percentage of expenses to earnings.....	76.01	74.01		2.00

HANNIBAL AND ST. JOSEPH RAILROAD COMPANY.

The main line of this road extends from Hannibal, Mo., to St. Joseph, Mo., a distance of 206.41 miles. It also operates 88.83 miles of branch lines, making a total of 295.24 miles operated. The roadbed, track, bridges, buildings, and equipment were inspected by the engineer of this Bureau in June last and found to be in excellent condition, many improvements having been made during the past year, the details of which will be found in Appendix No. 1 of this report.

A controlling interest in this road was acquired by the Chicago, Burlington and Quincy Railroad Company in 1883.

The equipment consists of 78 locomotives, 35 passenger, mail, and express, 1,477 freight, and 53 caboose cars, making a total of 1,581 cars. There are also 164 cars used in road-repair service.

The records of the General Land Office show that there had been patented to this company to June 30, 1890, 603,186.34 acres of land, but the company fails to report what disposition has been made of the same and the amount realized thereon.

The following statements show the financial condition of the company June 30, 1890:

Financial condition of the Hannibal and St. Joseph Railroad Company, June 30, 1890.

LIABILITIES.

Consolidated mortgage, 6 per cent. bonds.....	\$9,750,000.00
Quincy and Palmyra Railroad bonds, 8 per cent.....	433,000.00
Kansas City and Cameron Railroad bonds, 10 per cent.....	1,500,000.00
Accounts and bills payable.....	526,957.85
Land department.....	14,612.18
Total debt.....	8,934,603.03
Capital stock:	
Common.....	\$9,164,700.00
Preferred.....	5,083,034.00
Total stock and debt.....	14,251,734.00
	93,186,387.00

Financial condition of the Hannibal and St. Joseph Railroad Company, June 30, 1890—Continued.

ASSETS.

Construction	\$17,846,484.75
Equipment	3,442,615.07
Farmers' Loan and Trust Company	393,000.00
Investments	406,385.03
Sundry advances	120.00
Accounts and bills receivable	715,605.38
Accounts of doubtful value	3,465.56
Profit and loss	586,687.31
Materials on hand	104,204.58
Balance of cash accounts	257,717.00
Total assets	<u>23,756,284.68</u>
Surplus	<u>569,957.65</u>

Earnings and operating expenses for year ending June 30, 1890.

EARNINGS.

Passenger	\$602,250.12
Freight	1,872,555.32
Mail, express, and miscellaneous	443,356.79
Total earnings	<u>2,918,162.23</u>

EXPENSES.

Operating expenses, not including taxes	<u>\$2,073,949.49</u>
Surplus	<u>844,212.74</u>

LITTLE ROCK AND FORT SMITH RAILWAY COMPANY.

The main line of this road extends from Argenta to Little Rock, Ark., a distance of 165 miles, all of which is owned except 1.40 miles between Van Buren Junction and St. Louis and San Francisco Junction. There are 16 miles of sidings; 89.26 miles of the road are laid with steel rails and 80.74 miles with iron rails.

Since January 1, 1890, this road has been leased and operated by the St. Louis, Iron Mountain and Southern Railway Company, and the earnings and expenses for the last six months of the fiscal year have been merged with those of the lessee company.

During the first half of the year 1,003.84 tons of steel rails were laid at a cost of \$32,660.72, and 15,056 cross-ties placed in the track at a cost of \$5,072.19.

The equipment consists of 16 locomotives, 8 of which are equipped with Westinghouse brakes, 13 passenger cars equipped with Westinghouse brakes and Miller platforms, and 397 freight cars.

The operations of the land department will be found in the report of the St. Louis, Iron Mountain and Southern Railway Company.

The following statements show the financial condition of the company:

Financial condition of the Little Rock and Fort Smith Railway Company, June 30, 1890.

LIABILITIES.

Funded debt	\$2,699,237.25
Interest on same, due and unpaid	9,878.02
Interest on same, accrued, not due	81,987.50
Accounts payable	210,841.39
Total debt	<u>3,001,944.16</u>

Financial condition of the Little Rock and Fort Smith Railway Company, June 30, 1890—Continued.

LIABILITIES—continued.

Capital stock.....	\$4,505,308.18
Total stock and debt.....	7,507,202.74

ASSETS.

Road, fixtures, and equipment	\$6,054,083.73
Real estate other than road	313.82
Land contracts, land cash, etc.	1,635,908.56
Cash on hand.....	25,117.50
Stocks and bonds owned by company	135,317.58
Accounts receivable	512,215.87
Total assets.....	8,563,647.15
Surplus.....	856,394.41

Revenue and expenditures for six months ending December 31, 1889.

REVENUE.

Earnings	\$439,624.49
Discount and premium.....	888.45
Rentals.....	87,974.97
Sundry accounts.....	26,219.90
Total.....	553,708.81

EXPENDITURES.

Operating expenses and taxes.....	\$299,083.13
Interest on first-mortgage bonds.....	183,975.00
Sundry accounts.....	40,072.89
Due from the United States.....	725.37
Total.....	503,856.39
Surplus.....	42,850.52

LITTLE ROCK AND MEMPHIS RAILROAD COMPANY.

This company owns and operates 132 miles of road extending from Memphis, Tenn., to Argenta, Ark.

The road and equipment was inspected by the engineer of this Bureau in June last, whose report thereon will be found in Appendix No. 1.

The equipment June 30, 1890, consisted of 16 locomotives, 10 of which are equipped with train brakes; 13 passenger, 5 mail, express, and baggage, and 2 combination cars, all of which are equipped with air brakes; 123 box, 17 stock, 40 coal, 84 flat, 2 refrigerator, and 7 caboose cars, making a total of 293 cars in the passenger and freight service. There are also 114 cars in road-repair service. The company also owns one transfer boat, one wharf boat with steam elevator, and one steam shovel.

The records of the General Land Office show there had been patented to this company 142,295.51 acres of land to June 30, 1890, but the report of the company to this Bureau only gives the transactions of the land department for the last fiscal year, during which 2,185.16 acres were sold, and the receipts from all sources amounted to \$5,038.91. The average price per acre from sales during the year was \$3.60. There were outstanding on account of time sales \$7,989.18, and 51,687.79 acres remained unsold.

The following statements were compiled from the company's report:

REPORT OF THE SECRETARY OF THE INTERIOR. 537

Financial condition of the Little Rock and Memphis Railroad Company June 30, 1890.

LIABILITIES.

First-mortgage bonds	\$3,250,000.00
Pay rolls and vouchers	46,946.41
Due other companies on account of traffic	12,374.82
Land department	34,990.97
Total debt	3,344,312.20
Capital stock	3,250,000.00
Total stock and debt	6,594,312.20

ASSETS.

Road, fixtures, and equipment	\$6,429,817.29
Land contracts, cash, etc	7,989.18
Fuel, material, and stores on hand	24,792.25
Cash on hand	80,305.79
Accounts receivable	49,443.02
Central Trust Company, New York, for interest 1889 and 1890	289,000.00
Total assets	6,885,347.53
Surplus	291,035.33

Revenue and expenditures for the year ending June 30, 1890.

REVENUE.

Earnings	\$582,535.28
Receipts of the land department	8,038.91
Total	590,574.19

EXPENDITURES.

Operating expenses	\$431,759.19
New construction and equipment	1,040.82
Expenses of the land department	1,995.17
Total	434,795.18
Surplus	155,779.01

Comparative statement of the earnings and expenses of the Little Rock and Memphis Railroad Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger	\$233,134.21	\$278,268.00		\$45,131.79
Freight	311,062.10	313,884.57		2,822.47
Mail	15,205.23	15,552.68		347.45
Express	20,772.99	19,966.97	\$806.02	
Miscellaneous (deduction)	48.98	3,409.52	3,360.54	
Total	580,125.55	624,260.70		44,135.15
EXPENSES.				
Maintenance of way and structures	96,315.63	144,386.99		48,071.36
Maintenance of equipment	37,383.99	42,114.49		4,730.50
Conducting transportation	205,511.40	203,812.21	1,699.19	
General expenses and taxes	74,322.66	75,346.09		1,023.43
Total	413,533.68	465,659.78		52,126.10

Comparative statement of the earnings and expenses of the Little Rock and Memphis Railroad Company—Continued.

	Year ending—		Difference.	
	June 30, 1899.	June 30, 1898.	Increase.	Decrease.
Net earnings	\$158,591.87	\$158,690.02	\$7,998.05	
Average miles operated	150	139		
Earnings per mile	4,361.85	4,092.60		421.84
Expenses per mile	2,509.28	2,467.29		291.02
Net earnings per mile	1,852.57	1,192.49	66.08	
Percentage of expenses to earnings	71.71	74.59		3.39

MISSOURI, KANSAS AND TEXAS RAILWAY COMPANY.

This road is still operated by the receivers appointed November 1, 1888, by the circuit court of the United States for the District of Kansas.

The mileage of the road owned and operated June 30, 1890, was as follows:

	Miles.
Hannibal, Mo., to Boggy Tank, Tex., main line	853.61
Branch lines	724.67
Leased line from Paola to Coffeyville, Kans.	125.00
Operated jointly with Texas and Pacific Railway	71.19
Total operated	1,774.46

There are 150.66 miles of sidings on the main line and 69.75 miles on the branch lines. Steel rails are laid upon 1,473.73 miles and iron rails upon the remainder. The ballast consists of 159.55 miles of stone, 232.48 miles of gravel, 44.16 miles of cinders, 237.69 of sand, and the remainder of earth. There are 680.58 miles of barbed-wire and 95.86 miles of board fencing.

The expenditures for the year for additions and betterments to the railway amounted to \$1,239,425.61 and for equipment to \$695,462.84.

The equipment consists of 212 locomotives, 65 of which are equipped with air brakes and 118 with steam brakes; 3 chair, 54 passenger, 6 mail, 25 baggage, 27 combination, and 3 officers' cars, making a total of 118 cars in the passenger service, all of which are equipped with air brakes and Miller platforms. In the freight service there are 2,364 box, 1,015 stock, 1,542 coal, 344 flat, 168 refrigerator, 20 fruit, and 115 caboose cars, making a total of 5,569 cars in this service. There are 20 cars used in road-repair service.

The records of the General Land Office show that there had been patented to this company 983,825.96 acres of land. The Receivers' report the total cash receipts for the year ending June 30, 1890, as \$1,592.35, and that there remained outstanding on account of time sales the sum of \$6,715.50.

That portion of the road between Oswego and Junction City, Kans., was inspected by the engineer of this Bureau in June and found to be in fair condition. Some improvements had been made during the year between Parsons and Junction City by substituting steel for iron rails; but there still remains a large quantity of badly worn iron rails, which should be removed as soon as possible.

REPORT OF THE SECRETARY OF THE INTERIOR. 539

The following statements show the financial condition of the company June 30, 1890, as reported by the receivers:

Financial condition of the Missouri, Kansas and Texas Railway Company, June 30, 1890. (Receivers' statement.)

LIABILITIES.

Pay-rolls and vouchers	\$919,766.51
Due other companies on account of traffic	49,477.97
Other liabilities	20,319.43
Total	989,563.91

ASSETS.

Cost of construction of new line	\$307,401.12
Cost of new equipment	625,577.97
Betterments to road-bed and track	1,303,022.31
Fuel, materials, and stores on hand	300,634.67
Cash on hand	83,018.56
Accounts receivable	374,833.19
Due from other companies on account of traffic	114,540.22
Due from the United States	62,864.28
Total	3,171,892.32
Surplus	2,182,328.41

Revenue and expenditures for the year ending June 30, 1890. (Receivers' statement.)

REVENUE.

Earnings	\$8,491,910.18
Rentals	34,791.68
Other sources	29,094.57
Total	8,555,796.43

EXPENDITURES.

Operating expenses	\$6,583,149.84
Taxes	161,654.27
Interest on bonds	105,426.84
Expenses of the land department	4,326.30
Total	6,857,557.25
Surplus	1,689,239.18

Comparative statement of the earnings and expenses of the Missouri, Kansas and Texas Railway Company.

	Year ending.		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger	\$1,757,665.63	\$1,446,749.55	\$310,916.08	
Freight	6,182,490.31	4,707,251.92	1,475,238.39	
Mail	234,481.60	251,118.01		\$16,636.41
Express	142,019.79	136,495.87	5,523.92	
Miscellaneous	175,252.85	138,803.98	36,448.87	
Total	8,491,910.18	6,680,478.73	1,811,431.45	

Comparative statement of the earnings and expenses of the Missouri, Kansas and Texas Railway Company—Continued.

	Year ending—		Difference.	
	June 30, 1897.	June 30, 1899.	Increased.	Decreased.
EXPENSES.				
Maintenance of way and structures.....	\$1,756,153.63			
Maintenance of equipments.....	500,337.33			
Constructing transportation.....	3,538,335.81			
General expenses and taxes.....	612,257.75			
Total.....	6,747,684.11	\$1,748,234.91	\$899,449.20	
Net earnings.....	1,748,234.91	\$62,743.82	\$11,982.09	
Average miles operated.....	1,792.97	1,454.19	67.97	
Earnings per mile.....	4,963.60	4,132.56	\$831.04	
Expenses per mile.....	3,890.04	2,194.68	1,695.36	
Net earnings per mile.....	1,073.56	1,937.88	864.32	
Percentage of expenses to earnings.....	73.46	68.19		5.27

MISSOURI PACIFIC RAILWAY COMPANY.

On June 30, 1890, this company owned and operated 1,423 miles of road, as follows:

	Miles.
Main line, St. Louis, Mo., to Omaha, Nebr., owned.....	496
Branches in Missouri, Kansas, and Nebraska, owned.....	672
Branches in Missouri and Kansas, leased.....	254
Total.....	1,422

In addition to the above there were 30 miles of double track, 292 miles of sidings on main line, and 131 miles of sidings on branch lines. Steel rails are laid upon 1,349 miles of the road. The ballast consists of 124 miles of stone, 175 miles of gravel, 70 miles of cinder, and 1,053 miles of earth. There are 1,391 miles of barbed-wire fencing and 9 miles of board fencing. During the year 2,475 tons of steel rails were laid at a cost of \$83,369.23, and 367,726 cross-ties were placed in the track at a cost of \$146,737.12.

The rolling stock consists of 306 locomotives, 72 of which are equipped with Westinghouse brakes; 296 cars in the passenger service, all of which are equipped with Westinghouse brakes and Miller platforms; 10,896 cars in freight service; 40 in road repair service, and 725 hand and 630 push cars.

The following statements show the financial condition of the company June 30, 1890:

Financial condition of the Missouri Pacific Railway Company June 30, 1890.

LIABILITIES.	
Funded debt.....	\$44,376,000.00
Interest on same, due and unpaid.....	35,172.50
Interest on same, accrued, not due.....	694,326.72
Bills and accounts payable.....	1,384,234.40
Pay-rolls and vouchers.....	2,776,139.28
Total debt.....	49,866,868.90
Capital stock.....	44,374,000.00
Total stock and debt.....	\$94,240,868.90

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Financial condition of the Missouri Pacific Railway Company June 30, 1890—Continued.

ASSETS.

Cost of road and fixtures.....	\$49,665,335.00
Cost of real estate, other than road.....	739,152.18
Fuel, material, and stores on hand.....	373,906.93
Stocks and bonds owned by company.....	47,176,281.38
Total assets.....	98,837,041.31
Surplus.....	4,057,296.71

Revenue and expenditures for the year ending June 30, 1890.

REVENUE.

Earnings.....	\$10,091,543.01
Profits on stocks and bonds of other companies.....	1,489,585.28
Terminal facilities.....	193,840.21
Sundry amounts.....	501,687.26
Surplus branch-line earnings.....	467,933.20
Total.....	12,684,588.96

EXPENDITURES.

Operating expenses and taxes.....	\$7,334,466.69
Interest on funded debt.....	2,457,535.00
Interest on other debt.....	400,176.11
Expense account, Traffic Association.....	22,659.15
Dividends No. 36 to 39, inclusive.....	1,778,994.00
Discount and premium.....	110,753.50
Sundry expenses.....	189,102.87
Due from the United States.....	207.38
Total.....	12,293,894.70

Surplus.....	390,694.26
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Comparative statement of the earnings and expenses of the Missouri Pacific Railway Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger.....	\$2,077,694.96	\$2,175,842.69		\$98,147.73
Freight.....	6,622,320.89	6,019,014.06	\$603,306.83	
Mail.....	334,198.07	328,328.71	5,869.36	
Express.....	192,836.87	233,280.38		40,443.51
Miscellaneous.....	864,492.22	936,369.34		71,877.12
Total.....	10,091,543.01	9,692,835.18	398,707.83	
EXPENSES.				
Maintenance of way and structures.....	1,347,520.36	1,631,415.99		283,895.63
Maintenance of equipment.....	1,353,409.12	1,196,200.04	157,209.08	
Conducting transportation.....	3,328,281.70	3,112,208.48	216,073.22	
General expenses, taxes, and rentals.....	1,305,255.51	1,215,144.62	90,110.89	
Total.....	7,334,466.69	7,154,969.13	179,497.56	
Net earnings.....	2,757,076.32	2,537,866.05	219,210.27	
Average miles operated.....	1,422.00	1,422.00		
Earnings per mile.....	7,096.72	6,816.33	280.39	
Expenses per mile.....	5,157.85	5,031.62	126.23	
Net earnings per mile.....	1,938.87	1,784.71	154.16	
Percentage of expenses to earnings.....	72.68	73.81		1.13

NORTHERN PACIFIC RAILROAD COMPANY.

This company owns 2,628.60 miles of road and leases 1,413.80 miles of branch lines, making a total of 4,042.40 miles operated. The main line extends from Ashland, Wis., to Portland, Oregon, a distance of 2,117.99 miles.

There are 64.20 miles of double track, 388.49 miles of sidings on the main line, and 235.80 miles of sidings on the branch lines. Steel rails are laid on 4,160.40 miles and iron rails on 569.49 miles. There are 744.3 miles of fencing in addition to 179.3 miles of snow fences. The ballast consists of 38.46 miles of stone, 1,100.90 miles of gravel and 2,506.40 miles of earth.

Branch lines aggregating 574.10 miles in length were constructed during the past year. The expenditures for additions and betterments to the railway during the same period amounted to \$14,117,769.16, and for new equipment to \$1,833,904.97. The renewals of steel rails amounted to 17,001 tons, at a cost of \$523,731.29, and 1,849,636 new cross-ties were placed in the track at a cost of \$662,872.64.

The equipment consists of 407 locomotives, 382 of which are equipped with air brakes, 24 dining, 45 sleeping, 1 chair, 52 first-class, 41 second-class, 48 emigrant, 9 mail, 43 baggage, 18 express, 51 combination, and 15 officers' cars, making a total of 547 cars in the passenger service, all of which are equipped with air brakes and patent platforms. In the freight department there are 5,245 box, 272 oil, 856 stock, 1,290 coal, 3,832 flat, 15 fruit, 224 ferry, tank, and logging, 170 refrigerator, and 300 caboose cars, making a total of 11,704 cars in this service, 5,406 of which are equipped with air brakes. In the road-repair service there are 138 cars in addition to 783 hand and velocipede, 554 push cars, and 5 snowplows. There were added during the year 7 locomotives, 11 first-class, 2 emigrant sleeping, 11 dining, 10 baggage, 2 express, 4 mail, 12 sleeping, 100 refrigerator, 645 box, 1,014 flat, 300 coal, 180 logging, and 34 caboose cars, and 5 steam shovels.

The company reports the operations of the land department to June 30, 1890, as follows:

Number of acres of land received from the Government by patent, 1,292,804.78; certification of United States land officials, 20,169,290.17; total, 21,462,094.95 acres. There had been sold 7,387,285.01 acres, and the total receipts from all sources amounted to \$26,481,139.41. There remained outstanding on account of time sales the sum of \$5,581,459.60. The average price per acre received during the year was \$4.76, and the average price received from all sales to that date was \$3.95.

The engineer of this Bureau inspected the road in August, and found it to be in excellent condition. Extensive and important additions and improvements were made during the past year, the details of which will be found in his report thereon in Appendix No. 1.

The following statements show the financial condition of the company June 30, 1890:

Financial condition of the Northern Pacific Railroad Company, June 30, 1890.

LIABILITIES.

First-mortgage bonds.....	\$48,942,000.00
Other funded debt.....	65,278,778.72
Interest on same, due and unpaid.....	130,000.85
Interest on same, accrued, not due.....	1,943,178.96
Dividends unpaid.....	376,703.60
Bills payable.....	473,000.00
Accounts payable.....	1,579,611.29

Financial condition of the Northern Pacific Railroad Company, June 30, 1890—Cont'd.

LIABILITIES—continued.

Pay rolls and vouchers.....	\$4,692,031.56
Due other companies on account of traffic.....	13,314.71
Rentals, accrued, not due.....	178,879.23
Guarantee to branch lines.....	417,609.18
Suspense accounts, balance.....	3,421.13
Land sales, applicable to sinking fund.....	2,505,671.03
Revenue invested in sinking funds.....	3,420,513.65
Total debt.....	124,956,683.02
Capital stock.....	85,983,323.80
Total stock and debt.....	210,940,007.42

ASSETS.

Road and fixtures.....	\$165,978,860.44
Equipment.....	14,505,489.61
Invested in branch lines, owned in part.....	4,680,285.10
Land contracts, land cash, etc.....	5,581,459.60
Fuel, material, and stores on hand.....	2,360,961.92
Cash on hand.....	5,321,556.02
Stocks and bonds owned by company.....	4,976,251.91
Cash in hands of trustee for cancellation of bonds.....	197,687.53
Sinking fund in hands of trustee, company.....	3,420,513.65
Bills receivable.....	140,931.61
Accounts receivable.....	5,013,521.14
Due from other companies on account of traffic.....	339,487.61
Total assets.....	212,517,006.14
Surplus.....	1,576,998.72

Revenue and expenditures for year ending June 30, 1890.

REVENUE.

Earnings.....	\$22,610,502.78
Rentals—tracks, buildings, and grounds.....	318,288.39
Sundry accounts, miscellaneous and adjusted.....	22,273.41
Dividends on stocks of other companies.....	461,925.39
Interest on bonds.....	16,018.66
Proceeds, town property.....	510,370.94
Interest on miscellaneous investments.....	12,295.45
Receipts of the land department.....	1,660,629.44
Interest on company sinking fund, uninvested.....	6,504.86
Increase in funded debt.....	25,781,278.72
Total.....	51,400,084.04

EXPENDITURES.

Operating expenses.....	\$13,463,746.37
Interest on first-mortgage bonds.....	2,722,860.00
Interest on other funded debt.....	2,392,891.84
Rentals.....	2,757,029.06
Other charges.....	253,337.94
Sinking fund requirements, company.....	827,741.67
New construction.....	14,117,760.16
New equipment.....	1,883,904.07
Other property, branch roads.....	3,452,553.74
Dividends.....	1,112,732.00
Expenses of the land department.....	536,417.35
Preferred stock canceled.....	189,254.11
Surplus set aside.....	2,844,429.63
Increase in supplies.....	154,316.25
Land receipts, credited property account.....	570,421.18
Increase in securities owned.....	1,744,870.01
Total.....	49,024,265.38
Surplus.....	2,375,822.66

Comparative statement of the earnings and expenses of the Northern Pacific Railroad Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger	\$6, 148, 729. 09	\$5, 736, 390. 37	\$412, 338. 05	
Freight	15, 447, 885. 46	12, 471, 694. 59	2, 776, 190. 87	
Mail	451, 781. 32	443, 637. 77	8, 143. 55	
Express	330, 822. 47	298, 170. 18	32, 652. 29	
Miscellaneous	231, 264. 51	63, 971. 18	167, 293. 33	
Total	22, 610, 502. 78	19, 213, 264. 09	3, 397, 238. 69	
EXPENSES.				
Maintenance of way and structures	3, 574, 808. 72	3, 150, 506. 88	360, 808. 05	
Maintenance of equipment	2, 032, 648. 43	1, 891, 925. 65	141, 622. 78	
Conducting transportation	6, 132, 392. 63	5, 461, 454. 81	670, 938. 82	
General expenses and taxes	1, 784, 397. 58	1, 414, 154. 73	369, 642. 85	
Total	13, 463, 746. 37	11, 921, 335. 89	1, 542, 410. 48	
Net earnings	9, 146, 756. 41	7, 291, 928. 20	1, 854, 828. 21	
Average miles operated	3, 578. 41	3, 441. 42	136. 99	
Earnings per mile	6, 318. 58	5, 592. 94	725. 64	
Expenses per mile	3, 767. 49	3, 464. 07	293. 42	
Net earnings per mile	2, 550. 09	2, 118. 87	437. 22	
Percentage of expenses to earnings	59. 54	62. 04		\$2. 59

OREGON AND CALIFORNIA RAILROAD COMPANY.

This road forms a part of the through line of the Southern Pacific Company between San Francisco, Cal., and Portland, Oregon. The main line extends from Portland to the California State line, a distance of 367.10 miles. It has also a branch from Portland to Corvallis, 96.80 miles, and another from Albany Junction to Lebanon, 11.50 miles in length, making a total of 475.40 miles owned and operated.

There are 34.71 miles of sidings on the main line and 9.63 miles on the branches. Steel rails are laid upon 437.82 miles and iron rails upon 81.94 miles, 3,469 tons of new rails having been laid during the past year. The renewals of cross-ties amounted to 227,289, at a cost of \$51,746.53. There are 449 miles of the track ballasted with gravel, the remainder being of earth. The fencing aggregates 38.68 miles in length.

The equipment consists of 49 locomotives, 44 of which are equipped with Westinghouse brakes; 6 sleeping, 29 first class passenger, 11 baggage, 10 express, mail, and baggage, and 1 officer's car, making a total of 57 cars in the passenger service, all of which are equipped with Westinghouse brakes and Miller platforms. In the freight service there are 442 box, 241 flat, 24 fruit, and 10 caboose cars, making a total of 717 cars in this service, 165 of which are equipped with Westinghouse brakes. In road-repair service there are 33 dump and 3 wrecking cars and 1 pile driver.

The company reports that to June 30, 1890, there had been patented to it by the United States 323,068.68 acres of land, and that 225,170.57 acres had been sold, the total cash receipts from all sales amounting

to \$626,520.03. There remained outstanding on account of time sales the sum of \$516,287.66. The average price per acre for all sales during the year was \$6.32.

The roadbed, track, bridges, and buildings were inspected by the engineer of this Bureau in August last and found to be in very good condition, although seriously damaged by the flood of last spring, which necessitated many changes in the line in order to place the track upon higher ground and thus avoid similar damage in the future.

An enormous landslide occurred in Cow Creek Cañon, which moved a portion of the mountain across the cañon, so that the crest of the slide was about 127 feet above the bed of the creek, the base having a length of about 1,000 feet, thus causing the water in the creek to back up behind this wall for a distance of about three miles and submerging the roadbed to that extent, the water at the slide being about 87 feet in depth. After the water had broken over this dam it cut its way through the mass of débris, carrying large quantities of rocks and broken materials down the stream for a distance of $2\frac{1}{2}$ miles, rapidly filling up the bed of the creek and forming a new bed at an elevation of about 20 feet above the old track, thus rendering it necessary to change the location and build a new track for that distance. The details of damage done at various points and of improvements made during the year will be found in the report of the engineer, Appendix No. 1.

The following statements show the financial condition of the company June 30, 1890:

Financial condition of the Oregon and California Railroad Company, June 30, 1890.

LIABILITIES.

First-mortgage bonds	\$14,245,000.00
Interest on same unpaid	1,170.00
Dividends unpaid	2,570.73
Accounts payable	194,176.29
Income for redemption of bonds	295,608.90
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Total debt	14,738,525.92
Capital stock	19,000,000.00
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Total stock and debt	33,738,525.92
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ASSETS.

Road, fixtures, and equipment	\$31,318,750.00
Real estate, other than road	40,004.32
Land contracts, time sales	383,640.60
Sinking funds in hands of trustees	185,942.74
Bills receivable	1,250.00
Accounts receivable	1,885,493.31
Cash on hand	15,498.74
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Total	33,830,579.71
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Surplus	92,053.79

Comparative statement of the earnings and expenses of the Oregon and California Railroad Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger	\$1,913,580.30	\$911,499.08	\$992,081.22	
Freight	729,117.12	613,613.31	115,503.81	
Mail	69,593.90	61,944.41	7,649.49	
Express	84,726.45	27,929.34	56,797.11	
Miscellaneous	67,712.45	43,023.27	24,689.18	
Total	1,862,730.12	1,657,109.01	205,621.11	
EXPENSES.				
Maintenance of way and structures	475,231.40	337,220.19	138,011.21	
Maintenance of equipment	116,343.64	141,064.42	24,720.78	
Contracting transportation	536,129.74	424,767.33	111,362.41	
General expenses and taxes	175,693.69	134,274.74	41,418.95	
Total	1,297,397.47	1,037,326.68	260,070.79	
Net earnings	\$565,332.65	\$619,782.33	\$54,449.68	
Average miles operated	474.80	474.80		
Earnings per mile	\$1,188.61	\$1,305.36	\$116.75	
Expenses per mile	\$2,732.37	\$2,182.79	\$549.58	
Net earnings per mile	1,249.16	1,122.57	126.59	
Percentage of expenses to earnings	68.63	60.29	8.34	

ST. JOSEPH AND GRAND ISLAND RAILROAD COMPANY.

The main line of this road extends from St. Joseph, Mo., to Grand Island, Nebr., a distance of 252.52 miles. The company also controls and operates the Kansas City and Omaha railroad, 193.60 miles in length, making a total of 446.12 miles operated, all of which is laid with steel rails.

The Union Pacific Railway Company has a proprietary interest in this road by virtue of the ownership of a majority of its capital stock.

The equipment consists of 26 locomotives, all of which are equipped with Westinghouse automatic brakes; 11 passenger, 2 express, 3 baggage, mail, and express, and 1 officer's car, making a total of 17 cars in the passenger service, all of which are equipped with Westinghouse brakes and Miller platforms. In the freight service there are 452 box, 97 stock, 40 coal, 47 flat, and 12 caboose cars, making a total of 648 cars in this service, 490 of which are equipped with Westinghouse automatic brakes.

The records of the General Land Office show that there had been patented to this company 462,573.24 acres of land, but the company fails to report what disposition has been made of the same and the amount realized thereon.

The main line of the road between St. Joseph and Grand Island was inspected by the engineer of this Bureau in July, and found to be in fair condition. He reports that the road bed and equipment had been somewhat improved during the year, and that some of the station buildings had been put in order and repainted, and some additional fencing built.

The following statements show the condition of the company June 30, 1890:

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Financial condition of the St. Joseph and Grand Island Railroad Company, June 30, 1890.

LIABILITIES.

First-mortgage bonds	\$6,998,000.00
Certificates for first-mortgage bonds, etc.	21,126.57
Interest on first-mortgage bonds, accrued, not due.....	70,000.00
Other funded debt.....	1,679,000.00
Certificates for second-mortgage bonds	23,279.17
Accounts payable.....	562,464.76
Kansas City and Omaha Railroad, construction.....	6,793.88
Total debt.....	9,360,669.38
Capital stock	4,600,000.00
Total stock and debt.....	13,960,669.38

ASSETS.

Road, fixtures, and equipment	\$13,234,102.84
Stocks and bonds owned by company.....	468,500.00
Accounts receivable.....	244,619.60
Equipment improvement fund.....	23,639.63
Total assets.....	13,970,862.07
Surplus	10,192.69

Revenue and expenditures for the year ending June 30, 1890.

REVENUE.

Earnings	\$1,273,850.62
Discount and interest	1,576.92
Miscellaneous.....	14,003.61
Total	1,289,431.15

EXPENDITURES.

Operating expenses and taxes	\$772,474.69
Interest on first-mortgage bonds.....	420,000.00
New construction	5,454.26
Kansas City and Omaha guaranty	39,965.30
Old construction adjusted	48.01
Total.....	1,237,942.26
Surplus.....	51,488.89

Comparative statement of the earnings and expenses of the St. Joseph and Grand Island Railroad Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger	\$188,620.68	\$200,729.41		\$12,108.73
Freight.....	1,005,363.98	779,594.54	\$225,769.44	
Mail.....	19,854.22	19,851.72	2.50	
Express	17,702.04	18,956.34		1,254.30
Miscellaneous	42,309.66	38,966.64	3,343.02	
Total	1,273,850.62	1,058,099.65	215,750.97	
EXPENSES.				
Maintenance of way and structures	147,006.25	192,389.25		44,483.00
Maintenance of equipment	106,217.13	98,770.65	7,446.48	
Conducting transportation	579,601.93	849,689.20	29,012.67	
General expenses and taxes.....	138,719.38	122,806.79	16,442.59	
Total.....	772,474.69	763,156.95	9,318.74	

Comparative statement of the earnings and expenses of the St. Joseph and Grand Island Railroad Company—Continued.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
Net earnings.....	\$501,375.93	\$294,943.70	\$206,432.23	
Average miles operated.....	252.52	252.52		
Earnings per mile.....	\$5,014.55	\$4,190.16	\$824.39	
Expenses per mile.....	3,059.96	3,022.18	37.78	
Net earnings per mile.....	1,954.59	1,167.98	786.61	
Percentage of expenses to earnings.....	60.94	72.12		11.18

ST. LOUIS, IRON MOUNTAIN AND SOUTHERN RAILWAY COMPANY.

The main line of this road extends from St. Louis, Mo., to Texarkana, Ark., a distance of 490 miles. The company also owns 715 miles of branch lines in Missouri, Arkansas, and Tennessee, and leases 340 miles in Arkansas and Kansas, making a total of 1,545 miles owned and operated. There are 9.70 miles of double track, 187.26 miles of sidings on main line, and 108.53 miles on branch lines. Steel rails are laid upon 1,175.3 miles and iron rails upon 369.7 miles. There are 784.24 miles of barbed-wire fencing and 95.77 miles of board fencing. The ballast consists of 35.16 miles of stone, 297.80 miles of gravel, 46.64 miles of cinder, and 1,165.40 miles of earth.

On January 1, 1890, this company leased the Little Rock and Fort Smith Railway, 170 miles, and the Kansas and Arkansas Valley Railway, 165 miles in length, since which date the earnings and expenses have been merged with those of the lessee company.

During the year 5,903 tons of steel rails were laid at a cost of \$199,674.42, and 409,472 cross-ties placed in the track at a cost of \$140,315.58.

The rolling stock consists of 213 locomotives, 63 of which are equipped with Westinghouse brakes; 132 cars in passenger service, 122 of which are equipped with Westinghouse brakes and Miller platforms; 6,473 cars in freight service; 41 cars in road-repair service; and 255 hand and 241 push cars. The additions made during the year were 25 locomotives and 1,908 cars, the total expenditures for new equipment amounting to \$1,184,997.80.

This company received from the Government a grant of 63,293.46 acres of land in Missouri, 41,571.87 acres of which had been sold for \$208,211.79, and there remained outstanding on account of time sales the sum of \$33,045.59. In Arkansas there had been patented to the company 1,327,704.86 acres of land, 1,327,704.86 acres of which had been sold for \$1,986,804.30, and there remained outstanding on account of time sales the sum of \$517,511.56. The Little Rock and Fort Smith Railway received a grant of 1,057,762.79 acres of land, and had sold 517,591.13 acres for \$1,554,642.63, and there remained outstanding on account of time sales the sum of \$395,900.64.

The road-bed, track, buildings, and equipment were inspected by the engineer of this Bureau in June last, and found to be in very fair condition. His report thereon will be found in Appendix No. 1. The following statements show the financial condition of the company June 30, 1890:

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Financial condition of the St. Louis, Iron Mountain and Southern Railway Company, June 30, 1890.

LIABILITIES.

Funded debt.....	\$39,755,690.71
Interest on same, due and unpaid.....	40,690.23
Interest on same, accrued—not due.....	698,000.34
Accounts payable.....	2,604,496.97
Due other companies on account of leases.....	188,199.07
Car-trust certificates.....	1,043,000.00
Total debt.....	44,330,077.32
Capital stock.....	25,763,950.00
Total stock and debt.....	70,094,027.32

ASSETS.

Road, fixtures, and equipment.....	\$60,706,316.08
Real estate other than road.....	521,420.72
Land contracts, land cash, etc.....	2,259,526.92
Cash on hand.....	296,938.96
Stocks and bonds owned by company.....	8,540,382.21
Advances on account of surveys.....	33,753.89
Accounts receivable.....	1,398,906.69
Total assets.....	73,757,245.67
Surplus.....	3,663,218.35

Revenue and expenditures for the year ending June 30, 1890.

REVENUE.

Earnings.....	\$9,811,034.65
Profit on stocks and bonds of other companies.....	299,772.47
Sundry accounts.....	81,834.49
Total.....	10,102,641.61

EXPENDITURES.

Operating expenses and taxes.....	\$6,196,539.68
Interest on funded debt.....	2,412,472.19
Rentals.....	188,199.07
Expenses of traffic association.....	3,419.52
Dividend No. 2, December 31, 1889.....	1,930,248.00
Due from the United States.....	14,984.80
Discount and premium.....	1,466.58
Sundry accounts.....	157,283.26
Total.....	10,004,613.10
Surplus.....	98,028.51

Comparative statement of the earnings and expenses of the St. Louis, Iron Mountain and Southern Railway Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger.....	\$1,801,174.76	\$1,694,183.71	\$106,991.05	
Freight.....	7,218,136.09	6,052,100.62	1,166,035.07	
Mail.....	207,375.43	193,900.67	11,474.70	
Express.....	209,404.19	196,686.85	12,707.34	
Miscellaneous.....	284,143.58	251,395.78	32,747.80	
Total.....	9,810,234.65	8,390,277.63	1,419,957.02	

Comparative statement of the earnings and expenses of the St. Louis, Iron Mountain, and Southern Railway Company—Continued.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EXPENSES.				
Maintenance of way and structures.....	\$1,458,683.78	\$1,309,984.65	\$158,699.13	
Maintenance of equipment.....	687,472.34	881,452.63	193,980.29	
Contracting transportation.....	3,021,733.12	3,380,714.72	358,981.60	
General expenses and taxes.....	463,483.37	402,599.10	60,884.27	
Total.....	\$5,631,372.61	\$5,974,751.10	\$343,378.49	
Net earnings.....	\$3,899,639.89	\$3,130,960.74	\$768,679.15	
Average miles operated.....	1,745.00	1,190.80	554.20	
Earnings per mile.....	\$2,235.19	\$2,629.28	\$394.09	
Expenses per mile.....	\$3,230.55	\$5,004.40	\$1,773.85	
Net earnings per mile.....	\$2,504.64	\$2,622.88	\$118.24	
Percentage of expenses to earnings.....	68.55	62.61		2.96

ST. LOUIS AND SAN FRANCISCO RAILWAY COMPANY.

The main line of this road extends from St. Louis to Seneca, Missouri, a distance of 326.28 miles. It also operates fifteen branch lines, aggregating 1063.19 miles, making a total of 1329.47 owned and operated. The entire line is controlled by the Atchison, Topeka and Santa Fe Railroad Company.

During the year ending June 30, 1890, the company laid 2,271 tons of steel rails, at a cost of \$72,376.77, and 376,169 cross-ties were placed in the track at a cost of \$96,890.51. There were expended during the same period \$202,794.61 for new construction and \$133,312.60 for new equipment.

The rolling stock consists of 170 locomotives; 6 parlor cars, a one-half interest in 8 sleeping cars, 37 first-class, 14 second-class, 33 baggage, mail, and express, 25 combination and 3 officers' cars, making a total of 126 cars in passenger service. In the freight service there are 2,765 box, 1,014 stock, 1,588 coal, 37 flat, 50 refrigerator, 60 short mining and 94 caboose cars, making a total of 5,108 cars in this service. There are 170 cars used in road-repair service.

The records of the General Land Office show that 728,949.36 acres of land had been patented under the act of June 10, 1832, to aid in the construction of the Southwest Branch of the Pacific railroad of Missouri, which was purchased by the Atlantic and Pacific Railroad Company in 1870. The Saint Louis and San Francisco Railway Company purchased the property of the Atlantic and Pacific Company sold under foreclosure September 8, 1876, but failed to report what disposition was made of these lands and the amount realized thereon.

The following statements show the financial condition of the company June 30, 1890:

Financial condition of the St. Louis and San Francisco Railway Company, June 30, 1890.

LIABILITIES.

First mortgage bonds.....	\$31,523,500.00
Interest on same, due and accrued.....	698,263.00
Interest on same, accrued not due.....	213,261.66
Bills payable.....	1,377,209.00

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Financial condition of the St. Louis and San Francisco Railway Company, etc.—Cont'd.

LIABILITIES—continued.

Accounts payable.....	\$432,878.82
Pay-rolls and vouchers.....	541,739.92
Due other companies on account of traffic.....	33,041.14
Total debt.....	34,799,893.54
Capital stock.....	30,000,000.00
Total stock and debt.....	64,799,893.54

ASSETS.

Road fixtures, and equipment.....	\$57,719,226.51
Fuel, material, and stores on hand.....	196,770.44
Cash on hand.....	214,777.09
Stocks and bonds owned by company.....	6,044,172.73
Sinking-fund in hands of trustees, company.....	28,400.79
Bills receivable.....	2,287,079.43
Accounts receivable.....	1,641,510.38
Due from other companies on account of traffic.....	37,209.42
Total assets.....	68,169,148.79
Surplus.....	3,369,253.25

Revenue and expenditures.

REVENUE.

Earnings.....	\$6,394,068.74
Interest and profits on investments.....	100,932.76
Total.....	6,495,001.50

EXPENDITURES.

Operating expenses and taxes.....	\$3,646,449.52
Interest and rentals.....	2,404,937.24
Dividends Nos. 6 and 19.....	190,000.00
Total.....	6,241,386.76
Surplus.....	253,614.74

Comparative statement of the earnings and expenses of the St. Louis and San Francisco Railway Company.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger.....	\$1,290,044.05	\$1,260,047.84	\$30,096.21	
Freight.....	4,650,183.89	4,020,284.09	629,899.83	
Mail.....	138,503.25	129,073.57		\$9,429.68
Express.....	134,258.78	135,960.05		1,701.27
Miscellaneous.....	176,078.77	232,910.23		56,831.46
Total.....	6,394,068.74	5,807,175.75	586,892.99	
EXPENSES.				
Maintenance of way and structures.....	796,935.75	837,706.14		40,770.39
Maintenance of equipment.....	509,890.88	530,178.89	39,702.05	
Conducting transportation.....	1,715,440.85	1,557,871.44	158,009.41	
General expenses and taxes.....	504,192.04	607,672.01		43,479.97
Total.....	3,646,449.52	3,532,928.42	113,521.10	

Comparative statement of the earnings and expenses of the St. Louis and San Francisco Railway Company—Continued.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
Net earnings.....	\$2,747,619.23	\$2,274,247.33	\$473,371.90	
Average miles operated.....	1,329.47	1,329.47		
Earnings per mile.....	\$4,802.48	\$4,768.03	\$34.45	
Expenses per mile.....	2,742.78	2,637.39	105.39	
Net earnings per mile.....	2,060.70	1,719.64	341.06	
Percentage of expenses to earnings.....	67.03	69.83		12.80

ST. PAUL AND DULUTH RAILROAD COMPANY.

The main line of this road extends from St. Paul to Duluth, Minn., a distance of 155 miles. The company also owns 23.50 miles and leases 64.25 miles of branch lines, making a total of 247.75 miles operated.

During the year ending June 30, 1890, there were laid 1,363 ~~444~~ tons of new steel rails, at a cost of \$47,435.49, and 68,050 new cross-ties, at a cost of \$16,338.71.

There was expended during the year, for additions and betterments, charged to new construction, the sum of \$141,503.79.

The rolling stock consists of 66 locomotives, 24 of which are equipped with Westinghouse brakes; 71 cars in the passenger service, 61 of which are equipped with Westinghouse brakes and Miller couplers and platforms, and 2,387 cars in the freight service. There were added to the rolling stock during the year 10 new first-class passenger cars, at a cost of \$30,325.61.

The number of acres of land received by patent from the Government to June 30, 1890, was 815,482.75, and from the State of Minnesota 665,506.05, making a total of 1,480,988.80 acres. There had been sold 412,133.55 acres, the total receipts from all sales amounting to \$1,840,066.44, and there were outstanding on account of time sales, \$95,407.26.

The following statement shows the financial condition of the company on June 30, 1890:

Financial condition of the St. Paul and Duluth Railroad Company, June 30, 1890.

LIABILITIES.

First-mortgage bonds.....	\$1,000,000.00
Interest on same, due and accrued.....	1,225.00
Interest on same, accrued, not due.....	60,468.66
Other funded debt.....	2,710,000.00
Dividends unpaid.....	4,058.75
Pay rolls and vouchers.....	147,514.55
Sinking funds.....	59,448.79
Taxes accrued but not due.....	18,283.11
Deferred land and stumpage receipts.....	212,716.72
Accounts payable.....	103,778.90
Land and stumpage income expended prior to July 1, 1888, on improvements, construction, and equipment.....	788,566.40
Total debt.....	5,136,054.88
Capital stock.....	10,037,118.11
Total stock and debt.....	15,173,172.99

Financial condition of the St. Paul and Duluth Railroad Company, June 30, 1890—
Continued.**ASSETS.**

Road fixtures, and equipment.....	\$12,908,333.05
Land contracts, land cash, etc.....	212,716.72
Fuel, material, and stores on hand.....	62,131.16
Cash on hand.....	447,765.47
Other stocks and bonds.....	1,272,193.22
Miscellaneous investments.....	160,062.74
Bills receivable.....	4,611.31
Accounts receivable.....	160,541.18
Due from other companies on account of traffic.....	25,281.80
Cash applied to interest account.....	5,283.75
Cash applied to company's sinking fund.....	89,148.79
Suspense accounts.....	36,571.68
Insurance fund.....	3,542.06
Total assets.....	15,388,482.93
Surplus.....	215,305.94

*Revenue and expenditures for the year ending June 30, 1890.***REVENUE.**

Earnings.....	\$1,110,527.23
Dividends on stocks of other companies.....	4,200.00
Interest on bonds of other companies.....	200.55
Receipts of the land department.....	218,474.01
Interest and exchange.....	5,088.43
Track rentals.....	13,008.95
Total.....	1,651,499.17

EXPENDITURES.

Operating expenses, including taxes and rentals.....	\$1,099,462.21
Interest on first-mortgage bonds.....	50,000.00
Interest on other funded debt.....	100,000.00
Dividend, No. 16, payable July 16, 1890.....	134,117.50
Expenses of the land department.....	25,625.45
Other expenditures.....	26,912.31
Total.....	1,436,117.47
Surplus.....	215,381.70

ST. PAUL, MINNEAPOLIS AND MANITOBA RAILWAY COMPANY.

This company has submitted its report for the year ending June 30, 1890. On February 1, 1890, the Great Northern Railway Company took possession of all the railways, rolling stock, and equipment owned, leased, or controlled by this company, under lease for a term of nine hundred and ninety-nine years. The lessee company agrees to pay a rental sufficient to provide for yearly dividends of 6 per cent. on the entire capital stock of the lessor company, for interest on bonds, taxes, assessments, and all other current obligations.

The main line of the road extends from St. Paul to St. Vincent and Neche, Minn., connecting with lines running into Winnipeg, Manitoba, and westerly from Grand Forks, Dak., to Great Falls, Mont., with connections to Helena and Butte, Mont. There are 2,770.40 miles of single track, 26.92 miles of second track, 8.10 miles of third track, 8.10 miles of fourth track, and 361.62 miles of sidings. Steel rails are laid upon 2,498.66 miles, and iron rails upon 676.48 miles of the track.

The equipment consists of 259 locomotives, 82 of which are equipped with Westinghouse brakes; 6 dining, 38 sleeping, 100 passenger, 55

baggage, mail, and express, 22 combination, and 3 other cars, making a total of 224 cars in passenger service, all of which are equipped with Westinghouse brakes and Miller platforms. In freight service there are 5,839 box, 478 stock, 1,553 flat, 57 refrigerator, 171 caboose, and 16 fruit and other cars, making a total of 8,114 cars in this service. There are 139 cars used in road-repair service.

The company reports that it had received by patent 3,199,498.37 acres of land, and that it had disposed of 1,737,007.70 acres, the total cash receipts from all sales to June 30, 1890, amounting to \$5,504,870.21. There remained outstanding on account of time sales the sum of \$704,583.74. The average price per acre for all sales to this date was about \$6.50, the average for the year being \$7.09 per acre.

The following statement shows the financial condition of the company June 30, 1890:

Financial condition of the St. Paul, Minneapolis and Manitoba Railway Company, June 30, 1890.

LIABILITIES.	
Funded debt.....	\$52,785,000.00
Accounts payable and pay-rolls and vouchers.....	336,624.88
Taxes not yet due.....	7,998.12
Sinking fund, first mortgage bonds.....	3,791,801.87
Sinking fund, consolidated-mortgage bonds.....	8,029.11
Total debt.....	56,929,454.03
Capital stock.....	20,000,000.00
Total stock and debt.....	76,929,454.03
ASSETS.	
Road and fixtures.....	\$70,850,142.64
Equipment.....	7,705,326.85
Cash on hand.....	87,631.45
Miscellaneous investments.....	198,990.87
Bills receivable.....	121,603.59
Accounts receivable.....	240,150.71
Total assets.....	79,293,246.10
Surplus.....	2,273,792.07

As this road has been operated by the Great Northern Railway Company since February 1, 1890, the following statement shows the earnings and expenses for only the seven months ending January 31, 1890:

EARNINGS.	
Passenger.....	\$1,147,070.54
Freight.....	4,538,691.10
Mail.....	132,186.94
Express.....	84,789.78
Miscellaneous.....	251,693.10
Total.....	6,154,371.46
EXPENSES.	
Maintenance of way and structures.....	\$420,096.03
Maintenance of equipment.....	515,760.45
Conducting transportation.....	1,451,877.14
General expenses and taxes.....	637,521.54
Total.....	3,025,255.16
Net earnings.....	3,129,116.30

SOUTHERN PACIFIC RAILROAD COMPANY OF CALIFORNIA.

The mileage of this road June 30, 1890, was as follows :

Southern division:

	Miles.
Alcalde to Yuma.....	549.29
Los Angeles to San Pedro.....	24.24
Saugus to Elwood.....	91.50
Los Angeles to Santa Monica.....	16.83
Florence to Santa Ana.....	27.60
Berenda to Raymond.....	21.00
Stockton to Milton and Oakdale.....	49.00
Martinez to Tracy.....	46.51
Tracy to Los Banos.....	58.53
Miraflores to Tustin.....	10.80
Fresno to Porterville.....	69.30
Studebaker to Whittier.....	5.90
Thenard to Long Beach.....	3.80
	<hr/> 974.30

Coast division:

San Francisco to Tres Pinos.....	100.49
Carnadero to Santa Margarita.....	153.10
Castroville to Lake Majella.....	20.32
Pajaro to Santa Cruz.....	21.20
Aptos to Monte Vista.....	7.00
Hillsdale to Almaden.....	7.80
	<hr/> 309.91

Total 1,284.21

Both divisions were inspected by the engineer of this Bureau in March last and found to be in very good condition, many improvements having been made during the year, the details of which will be found in Appendix No. 1.

Steel rails are laid upon 1,209.02 miles of the road and iron rails upon the remainder. During the year 2,766.85 tons of steel rails were laid, at a cost of \$121,888.62, and 307,263 cross-ties placed in the track, at a cost of \$133,036.68.

The sum of \$1,850,369.94 were expended on account of additions and betterments to railway, \$1,291,450 of which was for the construction of 25,829 miles of new road. The expenditures for new equipment amounted to \$1,175,733.17, the company having purchased during the year 51 locomotives, 30 passenger, 2 baggage, mail, and express, 601 box, 226 flat, 48 fruit, 3 caboose, and 6 station cars.

The equipment consists of 242 locomotives, all of which are equipped with Westinghouse brakes; 3 parlor, 50 sleeping, 170 passenger, 26 emigrant and tourist, 3 mail, 26 baggage, 29 express, baggage, and mail, and 2 officers' cars, making a total of 309 cars in the passenger service, all of which are equipped with Westinghouse brakes and Miller platforms. In the freight service there are 3,563 box, 1,098 flat, 363 fruit, and 85 caboose cars, making a total of 5,109 cars in this service, 4,148 of which are equipped with Westinghouse brakes. There are 65 cars used in road-repair service.

The company reports that to June 30, 1890, it had received by patent from the Government 1,230,235.38 acres of land, and that it had disposed of 2,792,201.38 acres, the total cash receipts from all sales to date amounting to \$6,907,458.25. There remained outstanding on account of time sales the sum of \$2,981,572.03. The average price received from all sales was \$3.03 per acre.

The following statements show the financial condition of the company June 30, 1890:

Financial condition of the Southern Pacific Railroad Company of California, June 30, 1890.

LIABILITIES.

First-mortgage bonds	\$43,735,500.00
Accounts payable	3,075,824.34
Trustees land grant mortgage	304,545.13
Sinking funds uninvested	14,547.50
Total debt	47,321,474.97
Capital stock	95,501,524.00
Total stock and debt	142,823,000.97

ASSETS.

Road, fixtures, and equipment	\$114,815,875.02
Land contracts, land cash, etc.	2,822,437.19
Cash on hand	143,654.41
Sinking funds in hands of trustees	841,031.18
Bills and accounts receivable	4,524.97
Total assets	118,421,818.39
Surplus	13,710,495.35

Comparative statement of the earnings and expenses of the Southern Pacific Railroad Company of California.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger	\$2,790,319.67	\$3,129,824.10		\$339,504.33
Freight	4,730,680.05	4,717,076.81	\$21,713.14	
Mail	124,778.52	129,810.04	\$5,118.48	
Express	92,504.94	93,822.83		1,317.89
Miscellaneous	560,782.23	480,546.17	100,236.06	
Total	8,316,855.31	8,552,081.04		206,495.73
EXPENSES.				
Maintenance of way and structures	1,494,279.82	1,600,075.80		175,695.98
Maintenance of equipment	716,636.87	836,262.37		119,625.50
Conducting transportation	2,761,745.79	3,071,561.44		269,815.65
General expenses and taxes	772,079.21	684,358.23	137,500.98	
Total	5,734,741.69	6,193,197.84		428,806.16
Net earnings	2,581,783.62	2,358,883.20	\$221,946.42	
Average miles operated	1,275.96	1,240.82	35.14	
Earnings per mile	\$2,017.86	\$1,898.92	\$118.94	
Expense per mile	4,494.45	4,968.28	\$473.83	
Net earnings per mile	2,023.41	1,901.64	121.57	
Percentage of expenses to earnings	68.96	71.31		2.35

TEXAS AND PACIFIC RAILWAY COMPANY.

The president of this company has submitted a report for the year ending June 30, 1890, as required by section 13 of the act of March 3, 1871 (16 Stat., 573).

The mileage of the road on that date was as follows:

Eastern division:	Miles.
Texarkana to Fort Worth, via Marshall	250
Texarkana Junction to Fort Worth, via Whitesboro	239
Marshall to Shreveport	40
	529

	Miles.
Rio Grande division :	
Fort Worth to Sierra Blanca	522
Joint track, Sierra Blanca to El Paso	93
Branch to Gordon coal mines	6
	<hr/> 621
New Orleans division :	
Shreveport to New Orleans	327
Baton Rouge to Junction to West Baton Rouge	8
Westwego branch	1
Port Allen extension	3
Plaquemine branch	7
	<hr/> 346
Total	<hr/> 1,499

The New Orleans division was inspected by the engineer of this Bureau in June last, and found to be in fair condition, considering the great damage done to the roadbed and bridges by the great flood of last spring. His report thereon will be found in Appendix No. 1.

The equipment consists of 192 locomotives; 48 passenger, 10 combination, 19 excursion, 26 baggage, express, and mail, 1 pay, and 4 special cars, making a total of 108 cars in passenger service. In the freight service there are 1,916 box, 818 flat, 578 stock, 507 coal, 39 tank, 39 fruit, and 99 caboose cars, making a total of 3,996 cars in this service. There are 39 cars used in road-repair service.

Steel rails are laid upon 1,213 miles of the road. During the calendar year 1889, the sum of \$321,211.97 was expended by the company in additions and betterments to the railway, \$134,842.85 being on account of the Eastern division, \$20,704.16 on account of the Rio Grande division, and \$165,664.96 on account of the New Orleans division. During the same period the sum of \$177,415.52 was expended for new equipment.

The New Orleans Pacific Railway Company was consolidated with the Texas and Pacific Railway Company June 21, 1881. The records of the General Land Office show that to June 30, 1880, there had been patented by the Government 756,500.27 acres of land to aid in the construction of the New Orleans Pacific Railway, but the company fails to report what disposition has been made of the same and the amount realized thereon.

The following statements show the financial condition of the company June 30, 1890:

Liabilities and assets.

LIABILITIES.

Funded debt	\$53,778,602.06
Interest due and accrued	217,479.17
Texas school-fund loan	148,595.43
Interest, scrip, income, and land bonds	323,762.00
Other scrip	18,453.45
Pay rolls and vouchers	717,530.44
Due other companies	82,125.61
Bills payable	415,721.47
Estimated taxes	81,935.41
Unadjusted accounts, Gould-Huntington contract	174,296.29
Other unadjusted accounts	82,929.03
	<hr/>
Total liabilities	56,041,630.36
Capital stock	38,710,900.00
	<hr/>
Total stock and debt	94,752,530.36

PAPERS ACCOMPANYING THE

*Liabilities and assets—Continued.***ASSETS.**

Road and equipment.....	\$80,481,968.31
New second-mortgage bonds in treasury	1,763,000.00
In hands of trustees to retire first-mortgage bonds, E. D.....	3,951,000.00
Other bonds and scrip.....	43,132.00
Gordon coal mines	135,974.82
Capital stock, New Orleans Pacific Railway Company	6,712,500.00
Capital stock, California and Texas Railway Construction Company	615.00
Real estate at El Paso and New Orleans.....	86,600.00
Texas and Pacific car trust.....	262,000.00
Cash on hand.....	93,577.31
Due from agents and foreign roads	536,529.50
Advances to agents	21,936.68
Unclaimed wages	17,815.28
Bills receivable, land notes	160,308.54
Fuel, material, and stores on hand.....	285,252.69
Total assets.....	94,552,210.13
Deficit	200,320.23

*Revenue and expenditures for the year ending June 30, 1890.***REVENUE.**

Earnings	\$7,212,692.53
Equipment sold	19,039.96
Coupons and interest	4,810.04
Joint track earnings	5,996.83
Rentals	52,681.50
Sundry amounts	58,007.38
Bonds	3,304.00
Total.....	7,356,531.54

EXPENDITURES.

Operating expenses and taxes	\$5,756,284.60
Interest on funded debt	1,270,490.00
Interest and discount, etc	23,988.73
Traffic association expenses	522.40
Rentals	68,904.00
Investments	42,215.00
Car-trust debentures paid	33,452.76
Reorganization account, settlement of prior suits	16,012.86
New equipment	166,315.73
New boats and barges	46,564.32
New hospital building	14,599.98
Sundry accounts	13,469.14
Total.....	7,461,819.72
Deficit.....	105,288.18

Comparative statement of the earnings and expenses of the Texas and Pacific Railway Company.

	Year ending—		Differences.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EARNINGS.				
Passenger	\$1,737,389.22	\$1,613,099.33	\$144,289.89	
Freight	5,063,557.23	4,369,921.86	693,635.37	
Mall	197,137.56	194,824.12	2,313.44	
Express	146,687.65	168,000.00		\$21,312.35
Miscellaneous	43,921.47	42,380.87	2,540.60	
Total	7,212,692.53	6,388,226.18	823,866.35	

Comparative statement of the earnings and expenses of the Texas and Pacific Railway Company—Continued.

	Year ending—		Difference.	
	June 30, 1890.	June 30, 1889.	Increase.	Decrease.
EXPENSES.				
Conducting transportation	\$2,080,151.91	\$1,721,765.58	\$338,386.88	
Maintenance of way	1,358,671.59	1,043,452.10	315,219.49	
Motive power	1,633,277.68	1,559,565.27	73,712.41	
Maintenance of cars	295,448.60	281,477.85	13,970.55	
General expenses and taxes	408,734.82	395,826.58	12,908.24	
Total	5,756,284.80	5,002,087.33	754,197.47	
Net earnings	1,456,407.73	1,386,738.85	69,668.88	
Average miles operated	1,499	1,487	12	
Earnings per mile	\$4,811.66	\$4,296.45	\$515.21	
Expenses per mile	3,840.08	3,363.88	476.20	
Net earnings per mile	971.58	932.57	39.01	
Percentage of expenses to earnings	78.42	78.29	.13	

PERSONNEL OF THE BUREAU NOVEMBER 1, 1890.

The employes of this office, with their respective positions and salaries, on the above date were as follows:

Horace A. Taylor, Commissioner	\$4,500
William M. Thompson, bookkeeper	2,400
Francis E. Storm, assistant bookkeeper	1,800
Thomas Hassard, railroad engineer	2,500
John S. Martin, jr., clerk	1,600
Miss Kate Schmidt, copyist	900
William D. Nelson, assistant messenger	720

The jurisdiction of this office, under the act of June 19, 1878, extends over forty-nine original companies which, by consolidation and lease, are now represented and operated by twenty-three companies, with an aggregate of about 46,500 miles of road. It affords me pleasure to commend the general efficiency of the employes of this office, who have made accurate and comprehensive inspections of the property and accounts of these companies, as required by law.

CONCLUSION.

The report of the railroad engineer gives full information in regard to the physical condition of the several railroads inspected by him, and is submitted herewith as Appendix No. 1.

I have deemed it advisable to republish the principal acts of Congress relating to the several bonded and land-grant railroads coming under the jurisdiction of this office, which will be found in Appendix No. 2.

I have the honor to be, sir, very respectfully, your obedient servant,

Hon. JOHN W. NOBLE,
Secretary of the Interior.

H. A. TAYLOR,
Commissioner.

REPORT OF THE COLUMBIA INSTITUTION FOR THE DEAF AND DUMB.

OFFICERS OF THE INSTITUTION.

Patron.—BENJAMIN HARRISON, President of the United States.
President.—EDWARD M. GALLAUDET, Ph. D., LL. D.
Secretary.—ROBERT C. FOX, LL. D.
Treasurer.—LEWIS J. DAVIS, Esq.

Directors.—HON. JOSEPH R. HAWLEY, Senator from Conn.; HON. JOHN J. HEMPHILL, M. C. from S. C.; HON. R. R. HITT, M. C. from Ill., representing the Congress of the United States; HON. HENRY L. DAWES, of Mass.; HON. WILLIAM K. NINLACK, LL. D., of Ind.; REV. HYRON SUNDERLAND, D. D., Hon. JOHN W. FOSTER, Hon. J. RANDOLPH TUCKER, JAMES C. WELLING, LL. D.

COLLEGE FACULTY.

President and Professor of Moral and Political Science.—EDWARD M. GALLAUDET, Ph. D., LL. D.
Vice-President and Professor of History and Languages.—EDWARD A. FAY, M. A., Ph. D.
Emeritus Professor of Mental Science and English Philology.—SAMUEL PORTER, M. A.
Professor of Natural Science.—REV. JOHN W. CHICKERING, M. A.

Professor of Mathematics and Chemistry.—JOSEPH C. GORDON, M. A.
Assistant Professor of History and English.—J. BURTON ROTHCROFT, M. A.
Assistant Professor of Mathematics and Latin.—AMOS G. DRAPER, M. A.
Instructor in Gymnastics.—FRANK A. LEITNER.
Instructor in Drawing.—ARTHUR D. BRYANT, E. Ph.

FACULTY OF THE KENDALL SCHOOL.

President.—EDWARD M. GALLAUDET, Ph. D., LL. D.
Instructors.—JAMES DENISON, M. A., Principal; MELVILLE BALLARD, M. S.; THEODORE A. KIESEL, B. Ph.; SARAH H. PORTER.

Instructor in Articulation.—MARY T. O. GORDON.

DOMESTIC DEPARTMENT.

Superintendent.—WALLACE G. FOWLER.
Attending Physician.—D. R. SHUTE, M. D.
Consulting Physician.—S. S. LINCOLN, M. D.
Matron.—Miss ELLEN GORDON.

Assistant Matron.—Miss MARGARET ALLEN.
Master of Shop.—ALMON BRYANT.
Farmer and Head Gardener.—EDWARD MARGUM.

COLUMBIA INSTITUTION FOR THE DEAF AND DUMB, Kendall Green, near Washington, D. C., October 4, 1890.

SIR: In compliance with the acts of Congress making provision for the support of this institution, we have the honor to report its progress during the year ended June 30, 1890.

The pupils remaining in this institution on the 1st of July, 1889, numbered.....	76
Admitted during the year.....	23
Since admitted.....	30
Total.....	129

Under instruction since July 1, 1889, males, 100; females, 29. Of these 71 have been in the collegiate department, representing twenty States, the District of Columbia, and Canada, and 58 in the primary department.

A list of the names of the pupils connected with the institution since July 1, 1889, will be found appended to this report.

FAVORABLE ACTION OF CONGRESS.

In our last report mention was made of certain restrictive legislation had at the previous session of Congress, the effect of which on the usefulness of the institution was thought by the directors to be very unfavorable.

They therefore directed attention to the disastrous consequences likely to follow the enforcement of this legislation, and advised that it be repealed or amended.

Congress at its recent session gave careful consideration to these matters, and acted favorably on the recommendation of the directors.

The most important point involved concerned the basis on which students without means might be admitted to the college, and the following liberal provision was adopted in the Sundry Civil appropriation bill approved August 30, viz :

Provided, That deaf mutes, not exceeding sixty in number, admitted to this institution from the several States and Territories under section forty-eight hundred and sixty-five of the Revised Statutes, shall have the expenses of their instruction in the collegiate department paid from this appropriation, together with so much of the expense of their support when indigent, and while in the institution, as may be authorized by the board of trustees, with the approval of the Secretary of the Interior; and hereafter there shall not be admitted to said institution under section forty-eight hundred and sixty-five of Revised Statutes, nor shall these be maintained after such admission, at any one time from any State or Territory exceeding three deaf mutes while there are applications pending from deaf mutes, citizens of States or Territories having less than three pupils in said institution.

RECEIPTS AND EXPENDITURES.

The receipts and expenditures for the year under review will appear from the following detailed statements :

SUPPORT OF THE INSTITUTION.

RECEIPTS.

Balance from old account	\$495. 59
Received from Treasury of the United States	57, 531. 99
Received for board and tuition]	6, 420. 90
Received for work done in shop	232. 25
Received for work done in printing office	86. 60
Received for old metal	43. 09
Received for old carpet	17. 22
Received for witness fees	2. 50
	<hr/> 64, 830. 14

EXPENDITURES.

Expended for salaries and wages	30, 625. 71
Expended for groceries	7, 372. 04
Expended for ordinary repairs	3, 106. 85
Expended for special repairs in steam-fitting and plumbing	2, 421. 41
Expended for painting outside wood-work of buildings	916. 00
Expended for concrete pavement and repairs	629. 09
Expended for household expenses, marketing, etc	2, 962. 65
Expended for meats	3, 635. 85
Expended for bread	935. 70
Expended for butter	1, 852. 96
Expended for medical and surgical attendance	591. 85
Expended for rent of telephone	100. 00
Expended for furniture	1, 123. 64
Expended for dry-goods, etc	675. 66
Expended for lumber	914. 32
Expended for gas	998. 50
Expended for paints	389. 85
Expended for feed, flour, etc	796. 22
Expended for printing	253. 20
Expended for medicine and chemicals	301. 42
Expended for books, paper, etc	507. 02
Expended for hardware	781. 24
Expended for fuel	1, 988. 95

Expended for plants and flowers	\$113.25
Expended for blacksmithing	713.49
Expended for wagon and repairs	402.50
Expended for auditing accounts of the institution	300.00
Expended for land lying between the eastern boundary and Baltimore and Ohio Railroad	500.00
Expended for ice	345.83
Expended for manure	370.00
Expended for live-stock	420.50
Expended for harness and repairs	58.05
Expended for garden-seeds, etc	88.91
Expended for entertainment of pupils	80.00
Expended for china, glass and wooden ware	441.25
Expended for stamped envelopes	21.80
Expended for potatoes	90.10
Expended for illustrative apparatus	191.86
Expended for investment through L. J. Davis, treasurer	405.50
Expended for funeral expenses of pupil	50.00
Balance	850.67
	<hr/> 64,830.14

INVESTED FUNDS.

The condition of the invested funds of the institution is shown by the following report of the treasurer, Lewis J. Davis, esq.:

WASHINGTON, October 3, 1890.

DEAR SIR: In compliance with the request of the directors, I have to report the condition of the various funds under my charge and belonging to the Columbia Institution for the Deaf and Dumb:

Belonging to the "general account:"

Real estate notes at 6 per cent	\$750.00
Cash on hand	1,539.83
	<hr/> 2,289.83

Belonging to the "manual-labor fund:"

Alexandria, Va., bonds	\$300.00
Alexandria, Va., scrip	51.00
Winchester and Potomac Railroad bonds	250.00
Real estate notes at 6 per cent	3,200.00
Part of real estate notes at 6 per cent held jointly with Gallaudet Memorial Art Fund	1,500.00
Cash on hand	335.43
	<hr/> 5,636.43

Belonging to "Gallaudet Memorial Art Fund:"

Part of real estate note held as above	500.00
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Respectfully, yours,

LEWIS J. DAVIS,
Treasurer.

Dr. E. M. GALLAUDET,
President, etc.

INSTRUCTION OF THE BLIND AND THE FEEBLE-MINDED.

Provision is made by Congress for the instruction of the blind and the feeble-minded of the District of Columbia in schools for such purposes in Maryland and Pennsylvania.

Applications for the benefit of these provisions must be made through the president of this institution.

There have been since July 1, 1889, twenty-nine blind persons as bene-

ficiaries of the United States in the Maryland institutions for the blind at Baltimore.

There have been eleven feeble-minded children belonging to the District in the Pennsylvania institution at Elwyn.

The provision made by Congress for the care and training of this latter class of persons is insufficient, and the importance of enlarged appropriations is earnestly urged upon the attention of Congress.

All of which is respectfully submitted by order of the board of directors.

EDWARD M. GALLAUDET,
President.

Hon. JOHN W. NOBLE,
Secretary of the Interior.

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GRADUATES.

It is not, however, by its partial course men that the college should be mainly judged, but by its graduates. These, during the period named, numbered eighty-nine. Coming from twenty-two States and the District of Columbia, they represented the country almost as completely as the entire attendance. Their careers may be grouped, avocations at different periods being noted in order to avoid repetitions, and five who have died being included in the following table of the

Occupations of Graduates.

Unascertained at this writing (of whom one died soon after graduating).....	4
Foreman of a daily newspaper	1
First assistant postmaster of a city, and editorial writer.....	1
Clerk to a recorder of deeds	1
Official botanist of a State	1
Deputy recorder of deeds in a leading city.....	1
Teachers	34
Teacher, and principal of a leading institution	1
Teachers, and founders of schools	5
Teacher, founder of a school, and principal of an institution.....	1
Teacher, principal of a leading institution, authority in microscopy, merchant in iron and steel	1
Teachers, and editors of papers for the deaf.....	4
Assistant professors in the college	2
United States examiner of patents, and attorney in patent law	1
Clerks in United States departments, and teachers.....	4
Clerk to the Librarian of Congress, and teacher.....	1
Clerks in United States departments, custom houses, and post-offices.....	8
Editors and publishers of county newspapers, and general printers.....	2
Bank clerk	1
Farmers and teachers	2
Ranchman	1
Teacher, and fruit-grower.....	1
Insurance clerk.....	1
Expert in the finishing of lenses.....	1
Publisher of a paper for the Methodist Publication Society.....	1
Teachers and missionaries among the deaf	3
Architect's draughtsman	1
Architect	1
Practical chemists	2
Partner in wholesale milling and flouring business	1
Total	89

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A glance at the occupations of the graduates tells much, but also leaves much untold. For instance, among the specialists, the botanist has correspondents in several countries of Europe who have repeatedly purchased his collections; he has written papers upon seed tests and related subjects which have been published and circulated by the Agricultural Department.

The microscopist was a founder and is a recognized leader in one of the foremost microscopical societies in the country; he was for several years principal of a leading institution, and then compiled the *Raindrop*, perhaps the best publication extant for young deaf children, and he is still at work on future volumes of it; upon ceasing to be principal he declined to stay in the same institution as teacher, though urged to do so, and struck out into a new field; after years of effort he has, with no partners, built up a successful business as a merchant in iron and steel.

The attorney has been admitted to the United States Supreme Court, and is reputed to command an income of \$15,000 per year.

One of the editors and publishers has a silent partner, but he alone created and sustains the reputation of his paper, besides managing all the details of a large printing business; Senators and Representatives in Congress have testified that the paper is an elevating influence even in the center of cultured Massachusetts, where it is published, and its editorials are frequently copied by metropolitan newspapers.

The architect, scarcely yet four years graduated, has already won credit, but, content with no ordinary rank, has left an excellent position to perfect himself by study in Europe.

One of the chemists has been employed for years by corporations in the two chief cities of the West, and his contributions to scientific journals here have been reprinted in those of foreign countries.

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REGULATIONS.

I. The academic year is divided into three terms, the first beginning on the Thursday before the last Thursday in September and closing on the 24th of December; the second beginning the 2d of January and closing the last of March; the third beginning the 1st of April and closing the Wednesday before the last Wednesday in June.

II. The vacations are from the 24th of December to the 2d of January and from the Wednesday before the last Wednesday in June to the Thursday before the last Thursday in September.

III. There are holidays at Thanksgiving, Washington's birthday, Easter, and Decoration Day.

IV. The pupils may visit their homes during the regular vacations and at the above-named holidays, but at no other time, unless for some special, urgent reason, and then only by permission of the president.

V. The bills for the maintenance and tuition of pupils supported by their friends must be paid semi-annually, in advance.

VI. The charge for pay pupils is \$250 each per annum. This sum covers all expenses in the primary department except clothing, and all in the college except clothing and books.

VII. The Government of the United States defrays the expenses of those who reside in the District of Columbia, or whose parents are in the Army or Navy, provided they are unable to pay for their education. To students from the States and Territories who have not the means of defraying all the expenses of the college course the board of directors renders such assistance as circumstances seem to require, as far as the means at its disposal for this object will allow.

VIII. It is expected that the friends of the pupils will provide them with clothing, and it is important that upon entering or returning to the institution they should be

supplied with a sufficient amount for an entire year. All clothing should be plainly marked with the owner's name.

IX. All letters concerning pupils or applications for admission should be addressed to the president.

X. The institution is open to visitors during term time on Thursdays only, between the hours of 10 a. m. and 3 p. m. Visitors are admitted to chapel services on Sunday afternoons at a quarter past 3 o'clock.

XI. Congress has made provision for the education, at public expense, of the indigent blind and the indigent feeble-minded of teachable age belonging to the District of Columbia.

Persons desiring to avail themselves of these provisions are required by law to make application to the president of this institution.

REPORT OF THE SUPERINTENDENT OF THE YELLOWSTONE NATIONAL PARK.

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SUPERINTENDENT
YELLOWSTONE NATIONAL PARK,
Mammoth Hot Springs, Wyo., June 30, 1890.

SIR: I have the honor to submit the following report of my administration of affairs in the Yellowstone National Park during the fiscal year ending June 30, 1890.

I assumed charge June 1, 1889, in the midst of the travel season, and was at once so busily engaged that I did not keep any systematic record of events, and I shall be obliged to rely principally upon memory of incidents referred to.

PROTECTION OF FORESTS.

Probably the most important subject I have to report upon is the protection of the Park from forest fires. Last season was probably the most dry known in the history of Montana and Wyoming. Forest fires raged uncontrolled on every side of the Park and destroyed millions of acres of valuable timber. Commencing about the middle of July, the troops under my command were employed almost constantly and at times worked harder than I ever before saw men work, except perhaps after some disaster. Many times they were required to ride all night and fight fire all the following day.

Seventy fires are known to have occurred in the Park, all of which except three, were extinguished. One of these was between the Yellowstone and Shoshone Lakes, and before it was discovered had gained such headway that it was impossible for any force to do anything with it. It was off all routes of travel and the burnt district will seldom be seen.

The area was large and to be deplored. It was probably started by lightning as no person was believed to have been in that neighborhood; as it was not in the hunting or trapping season there were no inducements for people to penetrate that locality.

Another fire was started by some squatters just south of the Park boundary, which burned into the Park and did a great amount of damage. The other uncontrolled fire was the result of the grossest carelessness on the part of the lumbermen engaged in cutting lumber for the Lake Hotel. The fire spread from their camp fire and was three times under control and allowed to escape. It ran to the bank of the Yellowstone River and jumped it where it was 300 yards wide. This

fire crossed the road between the cañon and the lake and has left a very unsightly mark.

At the time the two latter fires were burning, every available man was engaged on a fire in the Madison Cañon, doing work which approached the heroic. For three weeks officers (Capt. P. S. Bomma and Lieut. P. E. Traub) and men struggled with this fire, and in the end controlled it. If it had not been controlled it would have reached the Gibbon Cañon, and burned over one of the most beautiful drives in the Park.

An instance will illustrate the character of the work. A detachment of Troop K, First Cavalry, left this post at half past 1 o'clock one morning in August and by 6 o'clock was at a point in Gibbon Cañon 28 miles away, where it joined a detachment of Troop A, First Cavalry, which had been at work all the previous day on a fire on the top of one of the sides of the Gibbon Cañon. The climb to the work was so difficult that two men had epileptic fits from the effort. The fire was in the timber and the ground covered with fallen dry trees.

It took me just an hour to walk around it in making an examination with a view to determining whether it was possible to do anything with it. Concluding that it was worth the trial, I called up all available men—twenty-nine in number—and by night a clearing was made entirely around the fire. All combustible matter was scraped away to the earth. The fire was surrounded and controlled. There was no water on the height, and the only way to do anything was to keep the fire within bounds and let the interior burn out. High winds prevailed almost every afternoon while this fire was burning, and at times the flames would jump the cut-off and get beyond control, but as soon as the wind subsided another cut was made, and at the end of three weeks the fire was out.

If this fire had not been controlled the prevailing westerly wind would have swept it across Hayden Valley and destroyed the feed on the greatest winter range of the buffalo and elk.

Many times during the season the camps were so stripped of men that those remaining were obliged to do guard duty upon alternate days.

Up to a late date last season there was no fire equipment in the Park. The few axes and shovels supplied the troops for garrison purposes were the only tools available. Application was made for funds for the purchase of axes, shovels, and folding rubber buckets, but through some misunderstanding the authority was not promptly received, and the work was doubly hard from want of proper tools.

While at the hotel communicating with a fire party by telephone, an incident occurred which I think should be mentioned in this report. I was greatly troubled that I had not what was needed, and mentioned to a party of gentlemen that I did not know what I should do. I had exhausted all men and implements under my control and was afraid that the Park would burn in spite of every possible effort. I remarked that I had applied for rubber buckets and had failed to get them; that I supposed the Secretary had no funds, etc.; whereupon Mr. J. Lewis, of Mauch Chunk, Pa., exclaimed that "if this great United States Government or the Secretary of the Interior has not money to buy you a few rubber buckets for the protection of this wonderful and beautiful country I have." He handed me \$40 from his purse. In three days I was supplied with two dozen buckets, which were of incalculable service during the remainder of the season. Would that Congress would take such an interest in the protection of the Park before it is too late.

It is proper to state here, that on the 27th of July I telegraphed to the Interior Department for permission to purchase buckets and axes for use in extinguishing fires. Prior to that time I had asked permission to expend not exceeding \$50 in extending a telephone line from the hotel at Mammoth Hot Springs to my office, and in putting up signs and placards marking routes of travel and objects of interest. On the 30th of July the Department directed me to expend not exceeding \$200, which was considerably more than the specific sums asked for, "for the matters referred to, towards telephone connection, signs, and placards, buckets, axes, and other incidentals necessary to the good management of the Park."

It is probably generally understood that the troops in the Park are engaged in the protection of the curiosities. They are so employed, but the amount of such work performed cuts so small a figure compared with the work on fires as not to be worth mentioning.

The work is probably not a military duty and certainly not desirable, but none other than thoroughly organized and disciplined men could be called upon to ride all night and fight fire all the next day, as has been done and done cheerfully.

Your authority for the establishment of regular camping grounds, where all camp fires can be examined as soon as abandoned, will, I think, do much to lessen the number of fires. Fires are generally traceable to camping parties. I do not charge much willful carelessness to them, but many have had no previous experience in camping, and leave their camps believing they have taken all necessary precautions. They may have left a brand, which in the morning was perfectly harmless, but in the afternoon, under the influence of high wind, becomes an incendiary of the worst character. The country has been so moist this season that I have not found it necessary to place any restrictions on camping. I shall, however, establish camps as soon as it becomes advisable.

I repeat my recommendation of last year, that there be supplied at least two tanks and the necessary number of draught animals for the transportation of water. It very often happens that fire gets into the dead roots of trees, where it can not be reached by shovels or axes. Such fires have to be watched for days or until burned out, while a few buckets of water would extinguish them at once. Special reference is of course made to fire at too great a distance from streams for the water to be carried by hand.

So much has been ably said and written upon the subject of the preservation of the Yellowstone Park that it seems hardly worth while for me to trouble you with any recital of the many reasons why Congress should deal generously with it. Language and art have so far failed to properly paint the beauty of the Grand Cañon; a single fire would seriously mar its grandeur by destroying its fringe of forest. The shores of the Yellowstone Lake have already been disfigured by fires. A single fire would entirely destroy the beauty of what bids fair to be one of the most delightful summer-hotel sites in the world.

I am so concerned for the safety of the banks of the Yellowstone Cañon that I do not permit any camping below the upper falls.

WATER STORAGE.

Visitors to the Park invariably leave it with the impression that no reasonable expense should be spared in protecting its beauties and objects of interest, but beyond all these, which can only be enjoyed by

persons of means, should be considered the protection of the forest as a water-storage system. The irrigation of the arid regions of the country is attracting a great deal of attention, and vast sums will probably in the next few years be expended in some system of water storage. The time and talent of Congress is being exhausted in devising schemes for the benefit of the countries receiving their waters from this neighborhood. Yet this great natural reservoir seems to pass unnoticed. We have here about 3,400 square miles of territory, 83 per cent. of which is timbered. The altitude is great and the snow-fall enormous. The whole area is indented with natural reservoirs of from a few feet in dimension to the extent of the Yellowstone Lake. The snow in the timber-clad mountains, protected as it is, melts slowly, and late in the season, after the spring rains have ceased, furnish water for irrigating purposes. The disastrous results of denuding the mountains of timber in China and other countries are too well known to require comment.

We have here the headwaters and water supply of two of the greatest mountain streams on the continent—the Yellowstone and the Snake. The freshets of the Missouri, which receives the waters of the Yellowstone, are now something terrible. The same may be said of the Snake, which has its early and later or June rise. What would be the result of only an early rise in the Snake? Simply destruction along its whole valley course. Later, when the water would be required for irrigation? Ruin to all those dependent upon a generous flow of the streams after the cessation of the spring rains. These results seem certain to follow the destruction of the forests of the Yellowstone National Park.

WILD ANIMALS.

I have every reason to believe that the protection of the wild animals in the Park has been perfect. I have no reason to believe that a single animal has been destroyed. The protection of the past few years has resulted in a great increase in all of the game animals. First in importance, on account of its almost extinction, comes the buffalo. As soon as the fires of the Park would allow me to leave the traveled routes I started out in an attempt to make something of an enumeration, but was not on their range two days before I became convinced that it was impossible. The animal, driven for safety, as he has been, to the mountain forests, seems to have entirely changed in his habits. In the summer season they are broken up into small bands and scattered over a wide area of timber-covered mountains. This I believe to be the result of the accidents of their lives. Probably when they first took to the forest they lost sight of each other, and in years adopted the habit of breaking up into families. In the winter the deep snows drive them to the open country for food. They are then found in large herds. This habit of dispersion and assembly seems to be very like the antelope.

The number of elk in the Park is something wonderful.

In the neighborhood of Soda Butte herds were seen last winter estimated at from 2,000 to 3,000. The whole open country of the Park seems stocked to its capacity for feeding. Other varieties of game animals are thought to be increasing rapidly.

As reported last year the herds of buffalo and elk do not seem to have enough calves. I am more than ever convinced that the bear and puma do a great deal of mischief and ought to be reduced in numbers. While they may be something of a curiosity to visitors to the Park, I hardly think them an agreeable surprise. Very few who come here "have lost any bear."

Visitors are sometimes a little incredulous as to the great number of large game animals in the Park and complain that they have seen nothing.

It is the habit of all animals which shed their antlers to seek the high points during the fly season, and while hundreds of elk and deer may be seen between the cañon and the lake in the first week of June, there are more at the end of the month. Very little expense would attend the inclosing of a band of elk at some point in Swan Lake Basin and of buffalo in Hayden Valley. I am sure they can be caught without any great trouble and inclosed so that all may at least see a sample.

The Park was visited last summer by Governor Francis E. Warren, of Wyoming, who manifested so lively an interest in the preservation of the game that after his departure I ventured to address him the following letter:

CAMP SHERIDAN, WYO., November 25, 1889.

DEAR SIR: We have, as you know, what is probably the last of the buffalo or bison left in the country. While in the Park they are comparatively safe from destruction, but, unfortunately, at certain seasons of the year they sometimes drift down into Wyoming and become a prey to the taxidermist hunter, who kills for the head.

The legislature of Montana at its last session enacted a law which will probably protect those which drift into Montana, as some occasionally do.

If you think well of it will you be good enough to ask your legislature for a similar bill? I believe the penalty should, however, be not less than \$500 or six months' imprisonment, and when a fine can be collected one-half should go to the agent of the Territory or the informer.

Unless everything possible is done this last remnant of our greatest American game will certainly be obliterated.

I have addressed a letter upon this subject to the secretary of Idaho.

If both Territories will take action the Park will be as well protected by laws of the States and Territories surrounding it as by the authorities stationed within.

I am, sir, very respectfully, your obedient servant,

F. A. BOUTELLE,
Captain First Cavalry, Acting Superintendent.

Governor FRANCIS E. WARREN.

Governor Warren took prompt action on my recommendation and the legislature of Wyoming at its last session enacted a law which, if enforced, as I believe it will be, will protect all buffalo straying off the reservation in that direction.

A similar communication was addressed to the secretary of Idaho and a reply received saying that the governor would lay the matter before the legislature, but I have not learned that any action was taken.

FISH.

Reference was made in my last report to the barrenness of many streams and lakes in the Park, and the hope expressed that through Col. Marshall McDonald, United States Fish Commissioner, these streams might be stocked. I take great pleasure in reporting that that efficient officer visited the Park last season and at once decided to commence the stocking of its waters. He sent out 7,000 young trout which were planted in the west and middle forks of the Gardiner River above the falls, the Gibbon River above Virginia Cascade, and the Fire-hole River above Keppler's Cascade. He has now hatched and ready for shipment as soon as I telegraph him that the mountains are passable 150,000 trout and salmon for the lakes and rivers of the Park. This great work will probably be accomplished by the middle of July.

It will probably be the greatest feat in moving large bodies of young fish ever attempted and will reflect a world of credit upon Colonel Mc-

Donald, through whose efforts in another direction the price of the laborers' pound of shad has been reduced from 10 to 3 cents.

Colonel McDonald while here though not in very robust health, was not willing to take anything on faith and made the trip on horseback over a very rough mountain trail to the Shoshone and Lewis Lakes and the outlet into Snake River, making examination of all the waters he proposed to stock.

It may not appear to all that the stocking of these waters is a matter of great importance, but, being an enthusiastic angler, it appears to me very desirable that all waters of this pleasuring ground for the people should be so filled with fish that all who come may enjoy the sport. The streams are full of fish-food and there can be no reasonable doubt of the success of the enterprise. Once stocked and protected, as they can readily be, until they begin to multiply, it will be impossible, in the short season the Park is accessible, to fish them out.

THE NATIONAL ZOOLOGICAL PARK.

During my visit to Washington last winter I had many conversations with Mr. W. T. Hornaday, at that time connected with the National Zoological Park, and had agreed to send to that institution living specimens of all of our wild animals. I told Mr. Hornaday that the energies of all under my command were at the disposal of any public enterprise or institution, but that some expense would attend the capture, care, and feeding of what I should be able to send. Mr. Hornaday thought that he would be able to place a small sum at my disposal to cover the expense of traps, food, etc. I have heard nothing from Mr. Hornaday's successor and conclude that he does not think well of the idea or that it has not been mentioned to him.

RIVERS AND BRIDGES.

The work done during the past year by the Engineer Corps under the immediate direction of Lieut. W. E. Craighill, Corps of Engineers, was of a very expensive character, it being principally in Gibbon Cañon and on a grade from the old to the new site of the hotel at Grand Cañon. Both works required retaining walls and many bridges.

About 16 miles of new road were constructed.

Some very groundless complaints have been made that more new roads were not opened by Lieutenant Craighill last season with the amount of money at his disposal. I believe he is following the proper system in building roads of a lasting character as he goes and that it would be bad policy to open any roads through the timber until all roots are removed and the road made smooth and comfortable. The journey through the Park is long and at best fatiguing. A large percentage of visitors are beyond the meridian of life and unable to endure any other than good roads. The appropriation bill for the next fiscal year, as prepared, requires all work to be done by contract. I am sure the person who advocated that proviso must have done so very thoughtlessly, or have been ignorant of the situation. Of course before any work can be done by contract, surveys must be made, specifications prepared, etc. The roads in the Park are in the spring crossed by many mountain torrents and many breaks occur. Some of these are of considerable extent, others too small to be considered in contract. The crust of the roads is soft and often broken through, requiring immediate

attention. Some drifts cross the roads which can only be removed by shoveling, etc.

As suggested in my telegram upon this subject, if the contract system is insisted upon, for the bulk of the work upon the roads and bridges a portion of the sum appropriated should be expended in repairs by day labor under the direction of the engineer officer in charge of the work.

About a month, with several engineers would have been necessary to make surveys and prepare contracts for repairs this spring. In the mean time the roads would have been closed, even to supplies for the hotels, and travel impossible. Visitors could not have made the tour of the Park before July 1.

The Park is a long way from the supply of labor and working material and equipment; consequently the competition on road work will be confined to a few who are now equipped. A ring will probably be formed and the work cost very much more than as now conducted.

In connection with appropriations for roads and bridges your attention is invited to the fact that preparations are being made for a great celebration in Chicago in 1893, which will probably bring to the United States more foreigners than any event in the history of the country. Liberal appropriations should be made in order that the roads through this National Park may be as nearly perfect as possible.

TRANSPORTATION.

The transportation in the Park, under the direction of Mr. George W. Wakefield, has been increased and carried nearly to perfection.

The coaches are as fine as human ingenuity can invent. In order that there may be perfect safety to passengers only perfectly gentle horses are purchased and used. They are obtained principally in Iowa, and cost about twice as much as the native horse of the country.

In the seven years Mr. Wakefield has been engaged in this business no passenger has ever received any injury.

Last year there was considerable complaint that passengers were not allowed stop-over privileges. I called Mr. Wakefield's attention to the matter and this year, besides the coaches, which make the regular trips, a daily stage leaves all the hotels for the accommodation of such as choose to stop over.

HOTELS.

I am sorry not to be able to report a better condition of affairs and progress in the matter of hotels.

The hotel at the Mammoth Hot Springs is about in character as when previous reports of superintendents were made.

The temporary shelter erected at Norris Basin after the destruction by fire of the hotel at that place in 1887 still represents a hotel with suitable first-class accommodations. Nothing has been done in the way of improvements. Not even common decencies have been provided.

Nothing has been done at either the Lower or Upper Basin hotels. At the latter point there is a very reasonable excuse for delay, as the law prohibits building upon the only suitable site in that basin. A bill now before Congress will, if it becomes a law, open this site to lease.

The two cottages at Lower Basin are very comfortable, but they will only accommodate comfortably 16 persons. When a greater number of visitors assemble at this point, all who can not be accommodated in

the cottages are lodged in the old hotel, where the partitions between the sleeping apartments are so thin that any conversation in one room is distinctly heard in all others in the immediate neighborhood. As an instance of this agreeable lodging, a few nights ago, two ladies occupied one of these rooms. Two gentlemen occupied an adjoining room, and amused each other with bawdy stories until midnight. No complaint was made, and it so happened that the manager knew nothing of it until morning, or he would have ejected the loafers from the building.

The association has thrown enough money in the direction of the Grand Cañon to erect and complete a fine hotel building, but through very bad management it is still in an unfinished condition, and through bad taste will, when completed, be an unsightly affair. When a new foundation is placed under it, it will, however, be a very comfortable and commodious house.

A good hotel is in course of erection at the Yellowstone Lake.

No adequate fire-escapes have been provided at the Mammoth Hot Springs hotel and none whatever at the Cañon hotel. A fire at either of these hotels would in all probability be attended by a loss of life.

Mr. T. B. Casey, acting president of the Yellowstone Park Association, has recently visited the Park and thoroughly examined all of the hotel buildings. He spoke very freely of the bad condition of affairs and will, I think, take active measures in the direction of reform and better hotel accommodations. I have recommended to him that the association complete the hotels at the cañon and the lake, provide common decencies at Norris and the Upper Basin, which will for the present and near future be dinner stations, and bend every energy upon a good hotel at Lower Basin in the neighborhood of the Fountain Geyser. This being done tourists will have good hotel accommodations at Mammoth Hot Springs, Lower Basin, the Grand Cañon, and the Lake, and not from necessity be obliged to spend any night at either Norris or Upper Basin hotels. Visitors spend two of the four nights usually spent in the Park at Lower Basin, and are, as before explained, very uncomfortable.

Mr. Casey's visit appears to be of great importance to all interested in the management. His attention was called to all imperfections in equipment and management; also, to the necessity for increased accommodations. I am not willing to believe that the gentlemen who form the Yellowstone Park Association are or have been indifferent to the comfort of the visitors, but they have other important business and have not known the necessity for giving the hotel business personal attention. It has been delegated to managers in the park and purchasing agents in the larger cities, some of whom have been unfortunate selections.

ELEVATOR AT GRAND CAÑON.

In compliance with your instructions of September 6, 1889, in company with Mr. Arnold Hague I made an examination of the Grand Cañon with a view to reporting upon the propriety of granting Mr. D. B. May, of Billings, Mont., a lease of ground with permission to erect an elevator or incline at the lower falls for the accommodation of visitors.

At the time the examination was made it was understood that the incline should follow the first gulch south of Point Lookout. If this had been required and no building permitted at the bottom of the cañon

the elevator would not have been so objectionable, but a lease has been granted permitting Mr. May to run in a direct line as near as may be and his plans indicate a straight line. The gulch has several turns, and, to run in a direct line from the top to the bottom of the cañon, it will be necessary to rear into view a very unsightly structure.

I regret that my report was not more full or that the lease was not referred to me before approval. Of course when I made my report I thought I had made a very thorough examination, but a further examination made this spring has convinced me that it was a mistake to approve of any elevator at the site mentioned, for it is impossible to put in an elevator to reach the bottom of the cañon without its coming in full sight and destroying the view from the head of the great falls. This is one of the grandest views on earth and doubly grand that the hand of man is nowhere visible.

Mr. May has had no proper examination made and was not prepared to make application for a lease at the time he received it. He was instructed that before any lease was granted he must have a careful survey made and furnish plans and drawings of everything.

I recommend that the lease be either canceled or that the incline be made to conform to the changes of direction of the gulch, and that no building of any kind be required or permitted at the bottom of the cañon.

DEPREDACTIONS.

There have been no depredations upon game in the Park so far as known during the past year.

A scheme was on foot to do some work last winter at the Lake hotel site, in which all of the principal employés of the Yellowstone Park Association were implicated. Guns, traps, and poison were to have been used, but the arrangement was well known in time and their plans came to naught. The matter has been fully reported in a special letter.

During the latter part of September there occurred one of the most outrageous acts of vandalism in the history of the Park. A man by the name of Rowley, who had been employed on the lake boat, visited the Upper Geyser Basin, and leaving the hotel at the dawn of day, before any other person was awake, he broke and carried away specimens from many of the geysers. The most material damage was done to the Sponge. Two pieces, half as large as a hand, were chipped from the inside of this formation. Generations will pass in repairing the damage done by this miscreant.

This is a strong illustration of the result of there being no law in the Park. If the scoundrel had not known that there was almost immunity he would never have thought of doing this mischief. As it was, he was on his way out of the Park, and the most that could be done to him was to hasten his departure a couple of hours and deprive him of his specimens.

I sincerely hope that Congress will soon provide a civil commissioner, before whom such law-breakers may be brought and properly punished.

The boundary of the Park is still unmarked and only known by the description contained in the organic act setting it aside. This is a very embarrassing situation. Hunters are liable at any time to get inside of the line through ignorance of its location. A survey, a small cut through the timber, and the piling of a few rocks in the open country is

all that is necessary and should not cost more than \$10,000 or \$12,000. Inclosed herewith please find a meteorological record of the station, kept by Hospital Steward Heinrich Vennemann, U. S. Army, stationed at Camp Sheridan, Wyoming.

As soon as suitable quarters are provided I shall ask General Greeley, Chief Signal Officer, to order a member of the Signal Corps to duty in the Park.

Very respectfully, your obedient servant,

F. A. BOUTELLE,

Captain First Cavalry, Acting Superintendent.

THE SECRETARY OF THE INTERIOR,

Washington, D. C.

REPORT OF THE SUPERINTENDENT OF THE HOT SPRINGS RESERVATION.

DEPARTMENT OF THE INTERIOR,

HOT SPRINGS RESERVATION,

OFFICE OF THE SUPERINTENDENT,

Hot Springs, Ark., July 15, 1890.

SIR: I have the honor to submit the following report of the operations of this office for the fiscal year ending June 30, 1890:

RECEIPTS AND EXPENDITURES.

There are thirteen persons and copartnerships owning bath-houses or bath house sites or claims on the permanent reservation who paid water rent for the year just closed.

Of the bath-houses off the reservation, the Eastman paid water rent from January 1, 1890, to the end of the fiscal year. All of the others off the reservation mentioned above paid water rent for the entire year.

The lease for a bath-house and hot-water privileges, executed by the Secretary of the Interior on January 25, 1889, to Moses P. Hayes and F. C. Laird, of Minneapolis, Minn., Phillip Reily, of St. Paul, Minn., and George W. Baxter, of Hot Springs, Ark., provides that the payment of water rent on forty tubs, \$100 per month, "shall commence on the 1st day of December, 1889," but, acting under specific instructions from the Department, I have not demanded or collected any water rent from said lessees.

The time for the completion of the bath-house with forty tubs provided for in the lease to William L. Bancroft, of Port Huron, Mich., dated March 1, 1889, and the payment of water rent thereunder, having been extended by the Secretary of the Interior, I have not demanded or collected any water rent from said lessee.

The Arlington Hotel is situated on the permanent reservation and pays an annual ground rent of \$1,000, which is paid quarterly in advance.

The total amount expended during the year is \$5,247.47.

The account, receipts and expenditures, may be stated as follows:

Receipts:

Water rent	\$12,000.00
Ground rent	1,000.00
	<hr/>
	13,000.00

Expenditures:

Salaries, expenses, repairs, improvements, etc \$5,247.47

Balance 7,842.53

This shows a net income to the Government on account of the Hot Springs Reservation of \$7,842.53 for the fiscal year.

Section 14 of the act of Congress approved March 3, 1877, reads as follows:

Section 14. That the money arising from the sale of lands shall be paid into the Treasury in the same manner as other public moneys arising from the sale of public lands, and held for the purpose herein specified and at the further disposal of Congress and the money arising from water-rents shall be under the control of the Secretary of the Interior, and expended by him for the purposes hereinbefore stated, an account of which shall be annually rendered to Congress, showing the amount received, the amount expended, and the amount remaining on hand at the end of each fiscal year.

* * * * *

PERMANENT RESERVATION.

By the third section of the act of Congress approved April 20, 1832, it was enacted "that the Hot Springs in Arkansas Territory, together with four sections of land including said springs, as near the center thereof as may be, shall be reserved for the future disposal of the United States, and shall not be entered, located, or appropriated for any other purpose whatever." Under said act the south half of sections 28 and 29 and all of sections 32 and 33, township 2 south, range 19 west of the fifth principal meridian, and the north half of sections 4 and 5, township 3 south, range 19 west, etc., were set apart, designated, and known as the original Hot Springs Reservation, containing 2,529.10 acres. The Hot Springs Commissioner, appointed under the acts of Congress approved March 3, 1877, and December 16, 1878, subdivided the original reservation as follows:

	Acres.
Hot Springs Mountain	264.93
North Mountain	224.74
Sugar Loaf Mountain	129.02
West Mountain	281.94
Area of city lots	1,270.10
Area of streets and alleys	358.37
Total area	2,529.10

The four mountains mentioned above, containing an area of 900.63 acres, constitute the "permanent reservation," which is "forever reserved from sale and dedicated to public use as parks." (Act of Congress approved June 16, 1880, section 3.)

The following table shows the number of city lots laid out by the Hot Springs Commission, the number awarded to individuals, the number sold and donated, and the number unsold, the title to which remains in the United States, viz:

Total number of lots laid out	2,019
Awarded to individuals	1,435
	584
Sold and donated	258
	326
Unsold	326

The superintendent is specially charged with the care, protection, and preservation of the permanent reservation. He is instructed that "special care should be taken to guard against the cutting or removal of

trees or shrubs, soil, earth, or rocks, or anything belonging to the reservation, unless such removal is for the purpose of beautifying the reservation or increasing the usefulness of the same, and then only under the specific direction of the superintendent." The reservation directed to be cared for, protected, and preserved in this manner, is a detached mountainous, rocky, rugged, and precipitous woodland, without roads and only a few bridle-paths. The exterior or boundary lines aggregate some 10 or 11 miles. It is surrounded by lands belonging to private individuals and a population estimated at 10,000. This care, protection, and preservation is proper and necessary, and should be continued and insisted upon, but the fact that no means or facilities for this purpose have been provided seems to have been overlooked.

HOT SPRINGS CREEK.

The most important and expensive public improvement made by the Government at this place is the stone culvert erected over Hot Springs Creek. Beginning at the junction of Park and Whittington avenues—whence two short branches reach out to receive and unite the waters drained through the valleys, along which said avenues run—the culvert traverses the reservation front and ends about 160 feet north of Malvern avenue crossing. Its total length, excluding the branches, is 3,500 feet, 17 feet wide, with an average height at the crown of 10 feet. About 1,500 feet of the culvert runs through the reservation front and beneath what I shall designate as Bath-House Park. The remainder, about 2,000 feet, is beneath Central and Reserve avenues and Valley street. The total amount appropriated for this improvement was \$136,744.78.

The culvert is in apparent good condition, and is a sufficient conduit for the drainage of the upper portion of the city and valley and lateral ravines.

PARKS.

The small park—Bath-house park—immediately in front of the bath-houses on the permanent reservation and on Central avenue, the main thoroughfare of this city, is well sodded with clover and grasses, maturing into a beautiful and inviting lawn, and a sufficient number of young shade trees. This small park is accessible and convenient to visitors and invalids, and should receive special care and attention. One of the most urgent needs is a liberal supply of water to preserve the lawn and young shade trees during the hot and dry periods of the summer and fall.

Congress has reserved from sale and dedicated to public use as parks the mountain areas of this reservation. Hence, we have in theory and in the national statutes "Hot Springs Mountain Park," "North Mountain Park," "Sugar Loaf Mountain Park," and "West Mountain Park." They are "parks" to the extent that they have been "reserved" and "dedicated" as such, but beyond that their existence and materiality are not apparent.

This reservation and dedication were made by act of Congress approved June 16, 1880, more than ten years ago. But since that time the Congress has wholly failed to make any provision for developing and beautifying these natural and splendid park sites. They are in the main just as nature shaped and left them. The dead and fallen trees and undergrowth—"the deep-tangled wild wood"—are within a stone's throw of the public bath-houses and in full view from the prin-

cipal streets and hotels of this city. In fact, the principal parts of the city are surrounded and hemmed in by this tangled and unsightly woodland. And this wild and chaotic condition of affairs, surprising and anomalous though it may seem and be, is enforced and maintained by the Government. The energy, pride, and ambition of the individual and the municipal authorities are restrained by its authority and command. And Congress has failed to appropriate one dollar to change this condition.

It is hoped that the time is near at hand when the Government will fully realize the great value and importance of its holdings here and the resulting trust and obligation to the public. Invalids, rich and poor, high and low, racked with pain and tortured by diseases that can not be successfully treated elsewhere, come here from all parts of this Union. They are told that the Government controls the reservation and the health-giving thermal waters, one of nature's most marvelous contributions to suffering humanity, and they come with a patriotic hope and an abiding confidence that where the Government controls, the surroundings and conditions are appropriate and inviting and that the citizen will be protected.

THE HOT SPRINGS.

The Hot Springs of Arkansas continue to grow in favor in the estimation of the public. It is truly wonderful to see the many remarkable cures effected by the use of these waters.

The number of visitors is steadily increasing each year, and the improvements and facilities for the accommodation, convenience, and comfort of the thousands who come here are keeping pace with this constant increase. But candor compels me to admit that the Government is not at the head of the procession in this grand march of development and improvement.

A quantitative analysis made by Prof. E. H. Larkin, of St. Louis, in 1856, gives $8\frac{1}{2}$ grains of mineral constituents to the gallon. The temperature of the water analyzed was 145 degrees. The following is the analysis made:

	Grains.		Grains.
Silicic acid.....	24.74	Water	1.72
Sesqui oxide of iron	1.12	Sulphuric acid	4.40
Alumina	5.15	Potash	1.46
Lime	28.93	Soda.....	2.01
Magnesia .....	.73	Iodide and bromide, a trace.....	
Chlorine .....	.07		
Carbonic acid.....	21.36	Total	100.00
Organic matter.....	8.31		

DISEASES TREATED.

Dr. P. H. Ellsworth, one of the leading and oldest physicians at Hot Springs, has kindly furnished the following list of diseases treated and benefited by the use of these waters, with some observations, viz:

Rheumatism, gout, stiff joints, skin diseases, scrofula, ulcerations and enlargements of the glands, general physical debility, mental exhaustion, spinal diseases, sciatica, lumbago, paralysis, St. Vitus's dance and all neuralgias or nervous affections, catarrh or ozena in all forms, dyspepsia, early stages of Bright's disease, diabetes, goitre, specific locomotor ataxia, spurious vaccinations and all blood poisons, uterine diseases as a class, especially sterility and climacteric illa, alcoholism and

the use and abuse of opiates, syphilis, mercurial syphilis, and all types of mercurial ills, together with such chronic diseases wherever alternate and eliminative agency afford relief.

Organic lesions of the brain, lungs, or heart, are not amenable to treatment by the use of these waters.

The diaphoresis established by the use these waters, and especially internally, opens up new channels for the expulsion of morbid secretion or principles injurious to health; thereby renewed vigor, new life, is vouchsafed those who seek properly the advantages offered.

Unlike the Turkish or Russian baths, where the diaphoretic process is the result of extreme heat, destroying the integrity of the blood in the effort of throwing off morbid secretion, thereby deparating the vital forces beyond a point of overcoming diseased action, or of advantage, at this place baths are given at low temperature, never above 95° or 100° Fahr. The eliminative and deparative results follow the use internally of large quantities of fresh hot water taken during baths, liquifying the blood, increasing the heart's action, stimulating the glandular bodies, especially the sudorifer glands, thereby throwing out of the system morbid secretions without destroying the life current or integrity of the circulatory medium.

Dr. J. L. Gebhart, who has made some interesting experiments to determine the electrical properties of the waters, says:

The electricity evolved in this water is of such low tension that it produces no effect whatever when tested by the most delicate electroscope, however great the quantity; and yet the galvanometer responds quite readily.

The electricity most singularly disappears when a bather, whose functional action is stimulated into a state of exalted activity, is immersed in an insulated bath-tub, as demonstrated by the comparative use of the meter with the bather in and out of it.

This I can explain only by recognizing the body of the bather as receiving either the heat of the water and correlating it into functional activity (which is simply a manifestation of vital energy in one form) or else that the body receives electricity and correlates it into vital energy. I incline to the former theory; however this may be, each seems to be the effect on the bather, and I regard this correlation of heat into vitality as the greatest curative factor in the waters of Hot Springs.

Dr. J. L. Gebhart, of Hot Springs, says of the use of these waters:

The immediate effect of a bath of 98° temperature of this water, as compared to a bath of ordinary water of the same temperature, is that this is very much more stimulating, exhilarating, and eliminant; the heat of the body is raised from three to four degrees, the action of the heart is augmented both in force and frequency, often increasing the frequency twenty-five beats in a minute, all the secretory organs becoming roused into greater activity—a feeling of pleasure and gladness—a modification of pain and weariness, and a relaxation of muscular and ligamentary contraction.

The effects of the continued use of these baths are: Remarkably great alterative action, correcting retrograde metamorphosis; equalizing and moderating nervous excitability; increased action of the entire absorbent system; increased disintegration of tissue; great increase of assimilation and reparation; unparalleled activity of all the excretory organs, eliminating mineral blood poisons rapidly, such as lead, mercury, and iodine, so rapidly that compounds of the two last named are here frequently prescribed and are often taken in heroic doses with almost perfect impunity; eliminating also all effete and poisonous products of the disintegration of tissue by the kidneys and skin, and the material abatement of the morbid craving for alcohol and tobacco in those who have acquired the habit of the excessive use of these stimulants. All of these therapeutic properties, more especially the alterative, are counteracted by the use of opium, tobacco, and alcohol. The latter are forbidden to patients. All these effects, as with nearly all other medical agents, are not strictly constant; even when the waters seem to be clearly indicated there is a small percentage of failures even at Hot Springs. In my opinion most of these failures are not due to lack of virtues in these waters so much as to their mismanagement and indiscretions on the part of the patients themselves.

The pathological conditions in which these waters are contra-indicated are: When the pulse is materially accelerated by the disease; an exalted action of the heart and arteries; where there is a tendency to active inflammation or any form of acute disease; where the action of the heart is in any way interfered with either by structural change or the presence of liquid in the pericardium; where there is a marked increase of the temperature of the body; in hectic fever; in cancer or any form of epithelioma; where there is a tendency to wasting hemorrhages, and with pregnant females.

EXPENSES AT THE SPRINGS.

Boarding and lodging per month.....	\$16 to \$150	
Physicians' fees per month	20	30
Medicines (if needed) per month.....	5	15
Bathing per month	5	10
Bath servants (if needed) per month	3	5
Total per month.....	47	150

These figures represent the highest and the lowest, though some can get along with less and others manage to spend more; but these give a general idea. The regular fees of physicians are \$5 for first examination, with bathing directions, and \$25 per month for office practice (two or three consultations per week). Higher charges are only made where extra attention is required and visits made at the hotels.

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APPROPRIATIONS.

I respectfully renew the recommendation made in my annual report for the fiscal year ending June 30, 1889, that an appropriation of not less than \$10,000 be made by Congress to be expended in clearing the underbrush and otherwise beautifying Hot Springs Mountain, and in laying out and building walks and drives around and over the mountains constituting the permanent reservation.

I am, sir, very respectfully, your obedient servant,

FRANK M. THOMPSON,
Superintendent,

The SECRETARY OF THE INTERIOR,
Washington, D. C.

ANNUAL REPORT OF THE UTAH COMMISSION.

OFFICE OF THE UTAH COMMISSION,
Salt Lake City, Utah, August 22, 1890.

Hon. JOHN W. NOBLE,

Secretary of the Interior, Washington, D. C.:

The Utah Commission respectfully submits the following report of its operations and proceedings for the past year:

After the August Territorial election of 1889 the Commission provided for the registration of votes for the Salt Lake and other municipal elections, the first-named election being fixed by law for the 10th of February, 1890. By reason of the fact that the August election had unexpectedly shown a Gentile majority of 41 in Salt Lake City, great interest was felt in the approaching municipal election by the people belonging to both political parties, and partisan spirit ran high. Both the Liberal, or anti-Mormon, and the People's, or Mormon parties, were thoroughly organized, and the campaign for the municipal election was fairly in progress as soon as the polls closed for the August election.

Before the adjournment of the summer session the Commission provided for the revision of the registration of the city by appointing a chief registration officer and seven deputy registrars, all of whom were, in the opinion of the Commission, competent, discreet, and of good re-

pute, and by issuing for their guidance in the discharge of their important and arduous duties a full and explicit circular of suggestions and advice.

In the latter part of September the Commission held a brief session in the city of Chicago for the purpose of preparing its annual report, but transacted no other business of importance, and adjourned to meet at Salt Lake City on the second Monday of January, 1890.

Subsequent to the adjournment of that meeting the following communication was received by the chairman :

SALT LAKE CITY, November 30.

Col. G. L. GOMREY,
Des Moines, Iowa :

The importance of the approaching election, the number of questions arising every day demanding the attention of the Commission, the fact that registrars are discriminating between parties and obstructing registration of legally qualified citizens, and the unanimous sentiment of the People's party demand the immediate presence of the Commission.

We expect to be able to show that justice demands the removal of the deputy registrars, and shall immediately file an application with the secretary requesting that action. We therefore ask that the Commission be called to assemble here immediately.

On behalf of the People's central committee,

H. M. WELLS,
Vice-Chairman.
R. W. YOUNG,
Secretary.

The chairman deeming the charge to be of too serious a nature to be disregarded, issued a call for a special meeting of the Commission to be held at Salt Lake City on the 10th of December, upon which date the Commission assembled and directed the secretary to notify Messrs. Wells and Young that the Commission had convened in compliance with their request, and was ready to hear any complaints or charges against any of the registration officers, and to request that the same be filed at once, which notification was immediately given as directed.

On the 11th the following charges were filed :

SALT LAKE CITY, UTAH, December 11, 1889.

The UTAH COMMISSION,
Salt Lake City, Utah Territory :

GENTLEMEN: The central committee of the People's party of Salt Lake City, on behalf of a large number of the qualified voters of said city and party, hereby make the following complaints against the deputy registration officers appointed by your honorable body for said city, to wit :

Against H. S. McCallum : That he has discriminated against certain voters by refusing to register them except at their homes but registering others not at their homes; that he has refused to correct the name of a registered voter which had been changed on the list, or to reregister him or correct the wrong in any way; that he has assumed to exercise judicial functions and pass upon the qualifications of citizens ready to take the oath prescribed; that he has declared his intention not to register such persons at any time, but threatened them with the penitentiary; that he has refused to register voters at whose residences he had called when they were not at home but who appeared at his office and asked to be registered, he declining to register them until after December 23, 1889.

Against E. R. Clute: That he has discriminated against voters as above described; that he has neglected his duty by spending his time at stations, hotels, business houses, etc., when he should have been visiting the dwellings of citizens, thus leaving many houses in his precinct unvisited; that he has registered some voters at his own house and refused this privilege to others on the same day.

Against J. R. Morris: That he has discriminated as aforesaid and by calling at certain houses and passing by others on the same block, sometimes skipping a house, but visiting those on either side of it; that he has refused to register, except at their homes, voters who called upon him and informed him that they could not remain at their homes, and desired to know where they could be registered, he replying that

he would have an office but could not tell when it would be open; that he has refused to state when he would visit certain families, or at what time, so that voters might remain at home and meet him; that he has refused to register voters who called on him after he visited their homes when they were not at home, until after December 23, 1889; that he has also assumed judicial functions, declaring persons not legal residents who have resided in this city for many years.

Against R. D. Winters: That he has also discriminated against voters as heretofore described; that he has neglected his duty as to house-to-house visiting; that he has declared his registration closed on November 27, and on November 28 for the fourth precinct, refusing to register any more persons in that precinct until after December 23, leaving many of them unregistered.

Against Louis Hyams: That he has discriminated against voters as aforesaid; that he has neglected his duty as to house-to-house visitation, and yet has stated that he could not possibly attend to it in the time; that after arranging and agreeing to register voters who came to him in the manner agreed upon he utterly refused to fulfill his promise and would not register them; that he has refused to register a number of the members of the People's party until after December 23; that he has not only refused to register voters at his office or house, but to inform them when he would be on his "beat" or when he would call at their houses.

From the general course pursued by the registration officers in this city we have good and ample reasons to believe that they are ready and willing to register members of the Liberal party but unwilling to register members of the People's party. Also that by the exclusion of a large number of legal voters from registration until the week commencing December 23 many of them will be prevented from registering, and thus a fair election will be prevented.

We respectfully ask your honorable body to inform the registration officers that the law in regard to visiting the houses of citizens is not so much for the convenience of the officers as that of the voters, and is intended to facilitate, not prevent, a full and fair registration. And it is their duty to register qualified voters at any convenient place within their precincts and at reasonable business hours. That they have no judicial powers and can not legally refuse to register persons ready to answer proper questions and take the oath prescribed by law. That they must not discriminate between members of different political parties. And that on failure or neglect to perform their duties they be promptly removed and other officers appointed in their stead.

We also ask further that your honorable body appoint a sufficient number of deputy registration officers, to be at the designated places during the week commencing on December 23, to register all qualified voters who have not been registered. And that additional registration officers, to at least the number of one for each precinct, be appointed from among members of the People's party. All the registration officers now appointed are known to be members of the Liberal party, strong and avowed partisans, ready to serve their political associates to the utmost of their power. We therefore urge that the party to which we are attached be accorded this representation in order that justice may be done and that the approaching municipal election may be conducted fairly and express the choice of the majority of the voters of this city.

On behalf of the central committee of the People's party of Salt Lake City.

Very respectfully,

HEBER M. WELLS,
Vice-Chairman.
RICHARD W. YOUNG,
Secretary.

Not deeming the charges to be sufficiently specific, the Commission ordered the following communication to be sent to the parties making complaint, which was done the same day, December 11:

OFFICE UTAH COMMISSION,
Salt Lake City, December 11, 1889.

Certain charges having this day been preferred by the municipal central committee of the People's party against the registrars of said city, it is ordered that the following reply be communicated by the secretary to the complainants, to wit:

Whereas your communication of the 11th of December, instant, charges the registrars of the city of Salt Lake, Utah, with divers acts in violation of the law and the instructions issued by the Utah Commission on the 13th day of August, 1889, based upon the law, a copy of which instructions are attached hereto, and calls upon the Commission to take cognizance of the charges, you are hereby notified that the Commission will on the 16th day of the present month, at 10 o'clock a. m., hear proofs of the charges.

The Commission requests and expects you to make such charges specific as to particular acts, times, and places, and the persons claiming to be affected as qualified voters by said acts. Such specific charges are expected to be filed as promptly as possible so that the registrars may be informed before the day set for hearing of the specific charges they have to meet.

And the said registrars are requested and directed to be present at said hearing and answer said charges.

Respectfully,

G. L. GODFREY,
Chairman.

To H. M. WELLS, Vice-Chairman; R. W. YOUNG, Secretary Municipal Central Committee, People's Party, Salt Lake City.

No reply was received to this until the 14th, when more specific charges were filed, as follows:

SALT LAKE CITY, UTAH, December 13, 1889.

THE HONORABLE UTAH COMMISSION:

GENTLEMEN: In response to your request of the 11th instant, that we "make specific charges as to particular acts, times and places, and the persons claiming to be affected as qualified voters by said acts" on the part of the registration officers of this city, we respectfully submit the following in addition to the complaint filed by us before your honorable body on the 11th instant, to wit:

That on the 26th day of November, 1889, C. J. Christiansen, a qualified voter of the First Precinct in Salt Lake City, called at the office of H. S. McCallum, who refused to register him. That James T. Jack, a resident of the said precinct, was present on the occasion and heard McCallum say that Christiansen was a "damned Mormon," and that he then and there registered the said Jack without objection. That on the 2d day of December said McCallum refused at his office to register Theo. J. Curtis, Henry Buckwater, Jacob Broman, and S. W. Andrew, all qualified voters of said precinct, stating that he would not register any one there, and that he did shortly after in his office register Edmund P. Smith.

That on the 10th of December Chas. J. Malquist, a qualified voter of the First Precinct, waited on the said McCallum in his office and asked to be registered. McCallum said he would have to wait until he called at Malquist's house. On being informed he had been there when Malquist was not at home, he refused to register him until after December 23, but would not say where. That in the early part of November last the said McCallum called at the residence of J. G. R. Haynes, a qualified voter of the First Precinct and showed him that his surname had been scratched off the registration list and the name of "Hains" written above it, and that McCallum then and there refused to correct the name, and also refused to register the said Haynes on his offering to take the registration oath anew.

That on the 25th day of November, 1889, Joseph Woolsey, a qualified voter of the first precinct, Salt Lake City, found H. S. McCallum at the St. James Hotel and asked to be registered, whereupon McCallum refused, saying he was not a bona fide resident, and that his wife had said he came here to vote. On Woolsey denying this and declaring the house at which the registration officer had called was his permanent residence and had been for more than one month, McCallum became angry and declared that there were four hundred colonizers here, and he would not register a G—d—d one of them, and threatened the said Woolsey with the penitentiary.

That on the 25th day of November, 1889, G. H. Backman, George L. Backman, and John F. Clark called on E. R. Clute, deputy registration officer for said precinct, at his residence, when he registered them on application, and that on the 25th day of November William Backman, brother of the two aforesaid citizens, applied for registration at the same place, and the said E. R. Clute refused to register him, stating he would only register men at their homes. That in the forepart of November, 1889, the said Clute called at a store on Main street in this city, and asked Henry P. Hovey if he had been registered and where he resided. He was told 238 Wall street in the Nineteenth Ward was Hovey's residence; whereupon he presented a registration oath filled out with the name of Henry P. Hovey, who signed it there, and then Clute went away, but soon returned, tore the oath out of the book, and said he would give it to the registrar of the precinct. That on the 23th day of November, George Lewis, a qualified voter of the second precinct, went to the said Clute, and asked to be registered, who refused him and said he would have to wait until he visited Lewis's house, as he would not register anybody except at their homes. That on the 24th day of November and on the 30th of November, also on the 3d, 4th, 5th, 6th and 7th days of December, 1889, and sundry other days, the said Clute spent the time visiting saloons, railroad offices, cigar stores, and other places on Main street, and did not go to the houses in his precinct for registration purposes, thus neglecting the duty required of him by law.

That J. R. Morris has repeatedly refused to register legally qualified voters of the third precinct who, though employed every day away from their homes, stated their willingness to call on him at any time he would name, but he would neither register them away from their homes nor state when he would call at their homes. Among these are J. R. Petersen and W. W. Nelson, who went to Morris's house three times about the middle of November, 1889; Niels J. E. Andersen, during the last week in November; John Gillespie, on the 26th day of November, and a number of voters represented by Archibald S. Geddes, on the 6th day of December, 1889. The said Geddes having been deputed by them to endeavor to arrange with the said Morris as to when, or about when, he would visit their houses, so that they might remain at home, but the said Morris refused to state when he would meet them or where he would be on that day or the following days. That after calling at the houses of qualified voters of his precinct when they were not at home he has refused to register them on their calling on him and requesting registration, to-wit: E. R. Udell and D. P. Callister, during the first week in December, and the said E. R. Udell again on the 12th of December, and that he has told them and many other legally qualified voters that he would not register them until on or after December 23. That on the 25th day of November the said Morris while going his rounds called at some houses and skipped others on the same street and block, to-wit: He passed by the house of Oliver B. Ostler, who is a member of the People's party, but visited the houses next to it on either side; that on the 26th day of November he visited several houses contiguous to that of John L. Nebeker, also a member of the People's party, but he did not call at his house; that after being informed by Mrs. Whipple that there were voters living in the rear part of her residence, 564 West, Third North Street, who desired to be registered, he failed and neglected to call on them. That on the 6th day of December, 1889, the said Morris visited houses along Pear Street, between Oak and Centre streets, but skipped the house of Wm. L. Butler, also a member of the People's party, though calling at the houses on either side of it. That on the 26th day of November the said J. R. Morris refused to register F. T. Greenberg, a qualified voter of the Third precinct, at the home of the voter who had resided for six years in that precinct, but who had returned from a visit to Sweden in June, 1889, on the ground that he had not resided in the territory six months, although informed by the said Greenberg that he had voted several times in this city and that this was his home, where his family had remained during his absence. Said Morris refused to register him until the time when an office would be opened for registration, thus exercising judicial powers and passing upon the settled question of domicile and denying to a legal voter a manifest right.

That R. D. Winters, registration officer for the fourth precinct, Salt Lake City, refused to register Walter E. Haks, John Helquist, and Charles Gies, qualified voters of said precinct, on the ground that his books were closed for the fourth precinct and that he would register no more in that precinct until he opened an office on December 23. That on the 31 day of December, 1889, between 3 and 4 o'clock in the afternoon, John A. Hamilton, a qualified voter of said fourth precinct, called on said Winters at his office and desired to know if his name was on the registration list or had been checked, and if not to be registered. He had previously tried on six several occasions to find the said Winters on the 30th day of November, between 9 a. m. and 5 p. m., for the same purpose, but had failed. That Winters refused to give him the desired information or to register him and said that the registration list for the fourth precinct was closed on November 30, and there was no registration officer now for the fourth precinct, as he had been engaged to register in the second precinct. That, in consequence of this closing registration in the fourth precinct before the period designated by law, many voters have been deprived of the right accorded to others. That after announcing his engagement as deputy registrar to assist in the second precinct he was waited upon by J. H. Moyle and W. C. Burton, representatives of a large number of qualified voters of the second precinct who had tried but failed to obtain registration, and requested the said Winters to designate the places or the locality he would visit in said second precinct as registrar on that day or succeeding days, so that workmen might be at their homes at the time he would agree upon. The said Winters then and there agreed to make house-to-house visitations in the fifth bishop's ward in said second precinct, designating the blocks he would visit on Thursday, December 5, 1889. That a large number of qualified voters were notified of this agreement who left their employment and waited for the said Winters at the places he had named, but he failed to appear and the said voters could not and did not find him and spent the half day waiting and looking for him in vain. That on the 5th day of December, 1889, the said Winters spent all day at sundry places on Main street, such as the Wasatch building, his office, different stores, Union Pacific Railroad office, Liberal headquarters, the White House bar, etc., and did not go to the place appointed to attend to his duty as registration officer. That on the 6th day of December, 1889, the said Winters during the morning went to some houses in the second precinct, passing by others contiguous thereto, crossing over fences diagonally

through a block, missing three families by the name of Marcroft on the south of said block and five families on the west side thereof. In the afternoon he passed the house of Mr. Higgs, a qualified voter of the second precinct, who met him and asked to be registered, but was refused by the said Winters because he had passed the said voter's house, although Mr. Higgs informed the registrar that he was hitchhitching his horse and could not reach him exactly at the house. Witness skipped the houses of G. E. Yendon, E. D. Crowther, E. S. Crowther, George H. Crowther, Harry Wanless, William Griffiths, etc., and on knocking at Martin Harrow's house left before there was time to answer.

Louis Hyams, registrar for the fifth municipal ward, has discriminated between voters as follows: By registering C. E. Cummings at said Hyam's house, December 5, while refusing to register F. H. Brooks at the same place December 7; by refusing to register D. F. Collett, December 10, either at his, said Hyam's, home or office, while registering Y. C. Wilson and J. A. Anderson at his office November 23, 1889, and by spending much of his time at or near Main street in stores or other places known to be Liberal strongholds, in manifest neglect of other parts of his ward where members of the People's party are more numerous; that upon refusing said D. F. Collett's registration at his, said Hyam's, home or office, as aforesaid, said Hyams informed him that he would now be found on his "beat" every day; and that in reply to Collett's question what part of his beat he would be found on that afternoon said Hyams positively refused to give him any information; that he has neglected to attend to his house to house visitations in the following manner: By spending November 25 and 26 in his office and in stores and saloons on and near Main street, without his registering book, except on the occasion of his visit on the latter date, to the Scandinavian saloon on Second South street; by spending November 27 until 2 p. m. in his office and on Main street, as aforesaid; by spending November 29 and 30 in his office and on Main street, as aforesaid, without his book; by spending December 2, 3, 4, 5, 6 in his office and on Main street and adjacent streets without his book, chiefly in visiting and revisiting the following places: the Union National Bank, A. C. Smith's drug store, Hogt's saloon, Sam. Levy's cigar store, the post-office, the Gaiety Saloon, the White House Bar, the Denver and Rio Grande Western depot, etc., with the exception of 2.15 p. m. to 3.45 p. m., December 4 from 3 p. m. to 5.50 p. m.; December 5 and part of the afternoon of December 6, when he visited a few stores along First South street as far east as Firemen's Hall; that December 5 said Hyams promised William Naylor, who went to him in the interest of a number of Naylor's friends and acquaintances who had sought registration by said Hyams and had been refused, that he would register all those whom said Naylor would vouch for as qualified residents of the fifth municipal ward; that pursuant to said agreement said Naylor went to said Hyams with two qualified voters and asked that they might be registered; whereupon said Hyams arbitrarily refused to register them, and said he would not register any one, either in his office or on the street, until December 23; that Mr. Hyams evinced a peculiar conception of his duties by stating to Mr. H. M. Wells, December 6, 1889, that he did not deem it necessary to visit all of the dwellings in the fifth municipal ward, because he had met many of the residents of said ward on the street and in other places.

These are but few of many similar cases that might be cited and of which there are ample proofs.

All of which is respectfully submitted on behalf of the central committee of the People's party of Salt Lake City.

HEBER M. WELLS,
Vice-Chairman.
R. W. YOUNG,
Secretary.

On the day set for hearing, December 16, the registrars with their attorneys, Messrs. W. H. Dickson, Parley Williams, E. D. Hoge, and Samuel Merritt, appeared and filed the following answer:

THE UTAH COMMISSION:

The undersigned deputy registrars, making answer to the charges preferred against them, respectively, and signed by Heber M. Wells, president, and R. W. Young, secretary, for and on behalf of the People's party, Salt Lake City, allege as follows, to wit:

Said H. S. McCallum, for himself answering, denies that he refused on the said 29th day of November, or at any other time, to register the said C. J. Christiansen, or that he then and there called him a "damned Mormon." Further answering he states the facts to be that at or about the said time the said Christiansen called upon this respondent and applied for registration, at his office at 229 South Main street, whereupon the said respondent made inquiry as to the residence of the said Christiansen and was in-

formed by him that he lived at a place that had been visited by respondent, as registration officer, during his visits from house to house one or two days previous; that on such visit he failed to find the residence of any such person and so informed the said Christiansen, and further informed him that he would make further inquiry as to his actual residence and right to be registered, since which time the said Christiansen has made no further application to respondent. Respondent has been unable to ascertain his residence, notwithstanding he has made further search and inquiry.

Respondent further answering says, that on or about the 2d day of December a number of persons, unknown to him, in company with Henry S. Buckwalter, accosted him on Main street and demanded to be registered; that the only one of said persons known to the respondent was the said Buckwalter, and who was informed by respondent that he was on the registration list; that the other of said persons not being personally known to him, and he being then engaged in his house-to-house canvass and not having completed the same, he declined then and there to register such unknown persons.

Respondent, further answering, says to the charge of refusing to register Charles J. Malquist, that he does not know the man, and has no remembrance of his ever having called at his office or elsewhere, but upon inquiry, since the said charge has been made, is informed that he is a resident of the second precinct of said city.

Answering the charge with reference to J. G. B. Haynes, the respondent says, that on the registration list furnished and certified to by the county clerk, and which he then had in his possession, the name Haynes had been erased, as he is informed and believes, by the county clerk, and in lieu thereof the name "Haney" was written, and not the name "Haynes;" that the respondent then and there informed the said applicant that his name was not upon the list, and that he would have to be registered and take the required oath; that upon further inquiry he informed the respondent that he was a naturalized citizen, but failed to produce his certificate of naturalization or any evidence except his mere statement; that respondent further informed him he must produce proper proof of his being a citizen before he was entitled to registration; that he has since made no further application to respondent, and has never produced any certificate that he was a citizen or that he was entitled to registration.

In answer to the said charge of Joseph Woolsey, respondent states the facts to be as follows: That on or about the 20th day of November, while engaged in making his canvass as registrar of said precinct, he called at the house No. 44½ South Third East street, and there met the wife of the said Woolsey and informed her that he was a registration officer, whereupon she informed the respondent that there were ten voters living there, meaning the said house; that this respondent entered the house, or that portion occupied by the said Mrs. Woolsey, consisting of two rooms, the outer room being about 12 by 12 and the other about 10 by 12 in size; that the outer room contained no furniture whatever, and this respondent found therein some eight rolls of blankets lying along the sides of the room; that the inner room had no furniture save a small table, capable of seating four persons, some four or five chairs, and a small cupboard; that the said Mrs. Woolsey informed this respondent that the ten men living in that portion of the house were from Kanosh and had been in the city about two months; respondent remarked to her that he supposed the boys "had come up to vote," to which she replied, "Oh, yes; they were sent up to vote." She gave the respondent the name of her husband, the said Joseph Woolsey, and the names of two of her brothers, and informed him that the balance of the men living there were Scandinavians, and that she could not recall their names, and would ascertain their names and give them to respondent the next morning if he would call at the house. Respondent promised to call on the following morning for the purpose of getting the names of the other occupants of said house, and as he was about to leave Mrs. Woolsey remarked, "I haven't said anything that I should not have said, have I?" To which respondent replied, "Oh no, it would be all right for the boys." The next morning respondent called according to his promise and Mrs. Woolsey then informed him that her husband told her to say to respondent that she was mistaken; that they did not come up to Salt Lake to vote, but was here to work. In consequence of the information thus acquired by this respondent he refused to register the said Joseph Woolsey upon his application made on or about the 28th day of November, 1890, and thereupon informed him of the ground of such refusal, as hereinbefore stated.

The said E. R. Clute, answering the charges made against him as aforesaid, says that as to the matter of William Backman the facts are as follows: The man claiming his name to be Backman came to his house and asked to be registered, to which he told him he did not register at his home, as it was not the registration office. He said that respondent had registered two of his brothers, to which said respondent replied that perhaps he had for accommodation. He afterwards met respondent on the street, who asked him to register him, when respondent asked if he had ever been registered and he said no; that respondent asked him where he lived, and he said in the Fifteenth Ward, and he then told him he would have to wait until he came to said

Backman's house; that respondent had not at the time referred to reached that portion of the city wherein the said William Backman lived in the course of his house-to-house canvass, but has since completed his house-to-house canvass and registered the said Backman. As to the allegation concerning Henry P. Hovey respondent answering says: that he went to the store of Cohn Bros., on Main street in Salt Lake City, where said Hovey was employed and made inquiries as to parties who were qualified to register, and among others spoke to the said Hovey and inquired of him if he was registered, Hovey to which replied he was not. Respondent inquired whether he desired to register, to which he replied that he did; thereupon the respondent filled out the usual oath, which the said Hovey signed and swore to. Respondent was then informed that there were other parties up-stairs qualified to register, and upon going up-stairs he was met by Mr. Jennings, who is employed in Mr. Cohn's store, who inquired of respondent if he had registered Mr. Hovey, to which respondent replied he had. He said that Mr. Hovey stated to him that he had not taken the oath, nor would take any such damn oath as the respondent read to him. Thereupon, after completing his business upon that floor, respondent returned down stairs and said to Mr. Hovey, who claimed to be a qualified voter in the third precinct, that he had since leaving him received information that would justify him in saying that he would have to apply for registration to the proper officer of his precinct, and thereupon the respondent tore up the oath that had been signed by the said Hovey.

That as to the charge made that on the 23d day of November respondent refused to register one George Lewis, and told him he would have to wait until he had visited Lewis's house, respondent has this to say: That he does not know the man Lewis; that he has made a thorough canvass of the second precinct and he has not found any such man and has no information or belief that would qualify him to state whether the said Lewis is or is not a person entitled to register; but that if he is entitled to register there will be an opportunity before the 25th day of December.

As to the charge that on the 29th day of November and on the 30th of November, and the 3rd, 4th, 5th, and 6th days of December, 1889, and on sundry other days, respondent spent the time visiting the saloons, cigar stores, and various other places on Main street, and did not go to the houses in his precinct for registration purposes respondent has this to say: That there are various business places, stores, offices, saloons, and hotels in his precinct, in which voters are engaged and in many of which buildings voters reside, and that as respondent understands the law it was his duty to visit such buildings within his precinct; that he has not spent his time upon Main street, but has been about his precinct. Respondent avers that he has completed his canvass throughout the precinct.

The respondent, J. R. Morris, for answer to the charges made against him, says: That he has refused during the period in which he was engaged in making a house-to-house canvass of his said precinct to register persons making application to him at his house or on the street, and that to have complied with the numerous applications made to him at his house and upon the street to register persons who are unknown to him would have so impeded him in his work of a house-to-house canvass of his precinct as to have rendered it impossible to have completed the canvass within the time required by law; that he has now completed the house-to-house canvass of his precinct, and has visited every house therein, but with the utmost diligence in making such canvass he was unable to complete the same until the evening of the 14th day of December, 1889. Said respondent denies that he skipped the house of Oliver B. Osler, or any house in the said precinct but on the contrary avers that he visited every house but one, which Neph S. Timpon's house, but did register the said Timpon afterwards; that as to the charge relative to the refusal to register the said F. T. Greenburgh, this respondent admits that he did refuse to register him; but denies upon information and belief, that he is a qualified voter; that he is not a citizen of the United States, and that at that time he had not resided in the precinct the requisite length of time to entitle him to register, even if he had been a citizen of the United States. Respondent further states that said Oliver B. Osler and also John L. Nebeker were duly registered at least two weeks prior to the filing of the charges herein.

Louis Hyams, answering the charges made against him, denies that he has discriminated between voters in any of the alleged cases or in any case; he alleges he has made a thorough canvass of his own precinct and has visited every house therein occupied in whole or in part by any qualified voter of said People's party; that the only houses omitted in said precinct were the houses of Liberal voters, personally known to him and whose residences were respectively known to him, and whose names were on the registration list.

Respondent R. D. Winters answering the charges against him; that the said Walter E. Hanks was registered on the 5th day of November; that he does not know John Helquist and Charles Giles and never refused to register either of them. That as to the charge relative to John A. Hamilton, respondent says that he has duly registered him and so informed him. Respondent denies that many voters have been deprived of registration in his fourth precinct, and that, on the contrary, alleges he made a

complete canvass of the said precinct, visiting every house therein. Respondent further says that on the 5th day of December he went to the Wasatch building and ordered a ton of coal, and afterward was detained and interfered with in his office by J. H. Moyle and W. C. Burton, who were undertaking to control the actions of the respondent and his official duties as registrar, and that other portions of the said day he was engaged in performing his business as assistant registrar for the second precinct. Respondent denies that he skipped houses on the 6th of December or any other time, or omitted families, but, on the contrary, alleges that all qualified voters by the name of Marcroft are registered and were checked off by respondent. Respondent further alleges that on the same day he checked off the name of Harry Wanless as a duly registered voter, and of George E. Yeadon, who is also duly registered, and were before these charges were preferred; that the said E. D. Crowther, E. S. Crowther, George H. Crowther and William Griffith are all registered.

The said respondents having answered to the matters in said charges which they are advised are material and necessary to be answered, ask that the same be dismissed.

H. S. McCALLUM.
E. R. CLUTE, Second Precinct.
JOSEPH R. MORRIS.
LOUIS HYAMS, Fifth Precinct.
R. D. WINTERS.

The People's party was represented by Messrs. Le Grand Young, Richard W. Young, and James H. Moyle, and the Commission at once entered upon the hearing of evidence, continuing the hearing from day to day until the 18th, when, there being no further testimony offered, the examination was closed.

Upon the 19th, after due consideration, the commission rendered the following decision:

Heber M. Wells, vice-chairman, and R. W. Young, secretary, municipal central committee of the Peo- ple's party, of Salt Lake City,	} Before the Utah Commission.	
<table border="0"> <tr> <td>H. S. McCallum, E. R. Clute, J. R. Morris, R. D. Winters, and Louis Hyams, deputy registrars for Salt Lake City.</td> <td>rs.</td> </tr> </table>		H. S. McCallum, E. R. Clute, J. R. Morris, R. D. Winters, and Louis Hyams, deputy registrars for Salt Lake City.
H. S. McCallum, E. R. Clute, J. R. Morris, R. D. Winters, and Louis Hyams, deputy registrars for Salt Lake City.	rs.	

On November 30, 1889, an informal charge against said registration officers was telegraphed to G. C. Godfrey, chairman of the Utah Commission, by the said complainants, whereupon he by telegraph called a special meeting of the Commission to be held in Salt Lake City on Monday, December 9, 1889.

In response to said call a quorum of the Commission met at the office in Salt Lake City on December 9, and notified said complainants that the Commission was ready to receive and act upon any charges they might prefer against said registration officers.

On Wednesday December 11, the said complainants presented to the Commission the following charges. [See page 580.]

Whereupon the Commission, deeming said charges defective for want of certainty, on the same day caused the secretary of the Commission to communicate to the complainants the following order to make the charges specific. [See page 581.]

And on Friday, December 13, at 9 p. m., said complainants presented the following amended written charges. [See page 582.]

And on Monday, December 16, 1889, said Commission having met in pursuance of said order to hear said charges and the evidence thereon, the said registration officers presented their answer to said charges as follows. [See page 584.]

Whereupon the Commission proceeded to hear the evidence and the arguments of counsel thereon daily until December 19, 1889, when the same was concluded and submitted for the final consideration of the Commission.

And the Commission having duly considered the same, do find and say that in their opinion the said charges so made and preferred are not sustained by the evidence, and that there has been no final or absolute denial of electoral rights.

The Commission do therefore acquit the said registration officers therefrom.

And upon the question of law bearing upon the said charges and the investigation thereof, the Commission is of the opinion that the registration officers are required by law to afford equal facilities for the registration of all legal voters.

That as to the qualifications specified in that part of the twenty-fourth section of the act of Congress approved March 3, 1887, prescribing what may be shown by affidavit,

the affidavit of the person applying for registration is sufficient to entitle him to be registered, and that the registration officer refuses such applicant at his own peril, and is only protected from the penalty of such refusal by being able to show conclusively that such applicant is not entitled to register and vote. But as to the qualifications prescribed in the latter part of said section, to wit: "No person who shall have been convicted of any crime under this act, or the act of Congress aforesaid, approved March 22, 1882, or who shall be a polygamist, or who shall associate or cohabit polygamously with persons of the other sex, shall be entitled to vote at any election in said Territory."

To quote from a late decision of Judge Zane, the chief-justice of the Territory, which decision is law, and binding on all within the jurisdiction, and should be obeyed unless reversed by competent authority:

"With respect to persons maintaining the polygamous relation the registrars would seem to have the right and discretion to inquire in any legitimate mode. Of course, it is his duty to exercise diligence and be reasonable."

"I am of the opinion that the registrar being required in all cases to determine the non-existence of the fact that a man is a polygamist, or is cohabiting polygamously with persons of the other sex, or the fact that he has committed any of the crimes mentioned in the act of Congress of 1882, or that of March 3, 1887, he has a reasonable discretion to make the inquiry. It may be said that in the great mass of cases it is not necessary to make the inquiry, but it is necessary for him to inquire as to all persons that he does not know, that he is not satisfied have not committed any of the crimes or are not maintaining the polygamous relation; it is his duty to make the inquiry and the mode of inquiry is not specified. He has the right to make it in any legitimate mode."

On all other preliminary questions we consider it the duty of the registration officer to register all voters who qualify themselves by taking the affidavit or affidavits required by law. But if he have such evidence of the falsity of the proffered affidavit as will protect him from the penalties prescribed by law for refusing to register the applicant, he may refuse at his own risk of incurring such penalty. This applies to the close of the registration December 28, 1889. That during the time fixed by law for hearing objections to the qualifications of any person registered as a voter a different rule applies.

Then the duties of the registration officer cease to be ministerial and become judicial in their nature. He sits as judge in that respect, and in that capacity should give a fair and impartial hearing to all whose cases may come before him during that time. No bias, prejudice, or partisan feeling should for a moment be allowed to influence his decision, because one of the dearest and most favored rights of citizenship is involved, and there is probably no redress for the party injured if the officer should act with partiality or unfairness.

He should administer justice with an equal hand to members of either party alike, casting aside all other questions as unworthy of consideration except the one question, "Is the person objected to a legal voter of the city of Salt Lake?"

Equality before the law should be the rule. No honest man, no matter what his political affiliations, could ask for more, or should ask for less.

G. L. GODFREY,
Chairman.

In the judgment of the Commission there was no foundation for so serious a charge against the officers named other than the suspicions of overzealous partisans, for the evidence which was offered in support of it not only proved the groundless nature of the charges, but demonstrated that if partiality, as alleged, had been shown by any registrar, it had been towards members of the People's party, and not towards those of the Liberal party.

There being no further business requiring the presence of the Commission, an adjournment was had to the 20th day of January, 1890, at which time the Commission again met in Salt Lake City.

On the following day Messrs. F. S. Richards and James H. Moyle, appearing as attorneys for the People's party, made verbal complaint that certain registration officers, who were then sitting to hear objections to voters under the provisions of an enactment of the legislature, were not performing their duties in an acceptable or legal manner; that they were retaining the registration oaths and not allowing an inspection of the same, and asked the Commission to order such inspection,

and to interfere with the conduct of the registrars so sitting to hear objections. The chief registration officer, being advised of this complaint, presented the following communication :

SALT LAKE CITY, *January 28, 1890.*

HON. G. L. GODFREY,
Chairman, Utah Commission :

SIR: I have the honor to state for the information of the Commission, that each deputy registrar of the city still has in his possession the oaths of voters registered anew, and the use of the oaths is necessary in making the final correct list of voters for the use of the judges on election day. The universal custom is, and always has been, to compare the signature of the persons registered with the name entered on the book to be used by the judges. Said lists are not complete, and will not be, until every name has been compared and checked as correct. The lists already made were not compared with the said oaths, consequently there are numerous complaints of errors which can only be corrected by a careful verification of the names signed to the oaths.

To give any political committee access to the said oaths at the present time will prevent a complete verification of the names registered.

HENRY PAGE,
Registrar.

The Commission, after hearing arguments from attorneys representing both party organizations, and after due consideration, on the following day rendered the following decision :

Complaints having been made to the Commission by the representatives of the People's party regarding the manner of conducting the hearing of the objections to persons who have registered as voters, the Commission after hearing arguments thereon is of the opinion (and the attorneys of both parties concur therein) that under the law as construed by the courts, the Commission has no right to control the registrars in the discharge of their official functions, so far as they are judicial in their nature, and there being a tribunal of competent jurisdiction in which all cases of complaint can be considered, and whose judgment will be conclusive and binding, and can be enforced, the Commission declines to advise said registrars further than it has done in the premises.

And applications being further made by the representatives of the said People's party for an order by the commission directing that they have access to the oaths taken during the course of registration, the Commission, after due consideration, is of the opinion that it would at present be incompatible with the proper discharge of their duties by the registrars to grant such request.

While these proceedings were being had before the Commission, suits had been brought in the third district court before the Hon. C. S. Zane, chief justice, against two of the registrars, asking that a peremptory writ of mandamus be granted against them to place the names of the parties plaintiff upon the registration lists, upon the ground that they had been unlawfully refused registration. These were understood to be test cases, and to cover the same grounds which were alleged against the registrars in the complaints made to the Commission. On the 18th of December the court decided against the complainants, rendering a long and well considered decision, which in effect sustained the rulings of the Commission upon the same subject. It is attached to this report as Appendix A.

A difference of opinion has arisen upon the question of the definition of the term polygamist, as applied to the right to register and vote, which causes considerable difficulty, and should, in the opinion of the Commission, be settled by explicit legislation. The Edmunds act of 1882 defines bigamy, polygamy, and unlawful cohabitation, and in section 6 gives authority to the President to grant amnesty to such offenders under such conditions and limitations as he may deem proper, and provides that no such amnesty shall have effect unless the conditions thereof shall be complied with.

Section 24 of the Edmunds-Tucker act of 1887 provides that—

No person who shall have been convicted of any crime under this act, or under the act of Congress approved March 2, 1883, or who shall be a polygamist, or who shall associate or cohabit polygamously with persons of the other sex, shall be entitled to vote in any election in said Territory.

The Supreme Court of the United States, in the case of *Murphy et al. vs. Ramsey et al.* (114 U. S., p. 45), seems to decide that, if the relation of plural marriage "has been finally and fully dissolved in some effective manner," which manner is not pointed out by the court, the status of polygamist ceases, and this has been followed by the district court of the Territory in the case of Bennett, charged with illegal registration, decided February 18, 1890. In this case Bennett had been divorced from his plural wife by a church divorce only. This decision is attached to this report as Appendix B.

Following these decisions the Commission has been of the opinion, and so advised the registrars appointed by it, that if the plural wife of a person offering to register had died, or the plural marriage relation had been dissolved by a separation, which was open and notorious, or by a legal divorce, the polygamous status of the husband was therefore at an end. But this view has been vigorously contested by lawyers of known and recognized ability, who hold to the opinion that only amnesty by the President can restore the right to register and vote. Their claim is, "once a polygamist, always a polygamist until amnestied."

Under the same decision of the Supreme Court of the United States, which gives the registrars authority independent of the Commission, certain registrars sitting to hear objections to voters under the law disregarded the principle therein laid down, and, following the non-judicial opinion referred to above, struck from the registration lists the names of certain parties who had been polygamists, whose plural wives had either died or been divorced, but who had neither received or applied for amnesty from the President. The Commission does not attribute to the registrars so acting any dishonorable motives or a desire to disregard the law, but credits them with an honest belief that the persons objected to came under the prohibition of the statute, and were polygamists within its meaning and spirit. The opinion of the registrars and of the lawyers who hold similar views is so well stated in the opinion they rendered at the time that we give it place here as follows:

BEFORE THE BOARD OF REGISTRARS OF SALT LAKE CITY, UTAH.

IN THE MATTER OF THE CHALLENGE OF D. WEBB vs. B. Y. HAMPTON ET AL.

These are cases in which the right of defendants to remain on the registry list of Salt Lake City is challenged on the ground that they are polygamists. The evidence shows that each of the defendants has, at some period since the passage of the anti-polygamy law of 1862, entered into the relationship of bigamy or polygamy.

Section 1 of the act of 1862 provides as follows: "Every person having a husband or wife living who shall marry another person * * * shall be adjudged guilty of bigamy," etc.

Man violates the law and the law fixes his status. The act of the individual consists in the marrying, the operation of the law in adjudging him a bigamist. It is true the individual places himself by his own act in antagonism to the law, but did not the law step in and fix his status, no such result would follow. In other words, it is not the individual but the law fixes his status.

Section 8 of the Edmunds law provides: "That no polygamist, bigamist, or any person cohabiting with more than one woman * * * shall be entitled to vote."

Section 24 of the Edmunds-Tucker act provides as follows: "No person who has been convicted of any crime under this act * * * or who shall be a polygamist, or

who shall associate or cohabit polygamously with persons of the other sex shall be entitled to vote."

In this section disfranchised persons are classified. First, those who have been convicted, etc.; second, those who are polygamists; third, those who associate or cohabit polygamously with persons of the other sex.

Now we think that no one will for an instant contend that a person who has been convicted of the crimes enumerated above could, by any act on his own part, restore his franchise. Not even a life of penitence and disavowal of his crime could change his condition. When he was convicted, the law stepped in and disfranchised him, and nothing short of the pardoning hand of the President of the United States can restore him to civil rights. This principle is too well established to admit of controversy.

Let us next consider the second class, to wit, polygamists. The law defines the term and makes those who commit the act guilty. This act does not include those who have been tried and convicted, but merely those who have committed the act only. When the individual has done the act the law says he is a polygamist. In what respect does the second class differ from the first, other than that of intensity? The status in both cases is fixed by one and the same law. If, therefore, the act of disavowal will change the status in one case, why not in the other? If the proposition that once a convict always a convict until pardoned, be true, then why not the same rule in polygamy? In one case the act leads to the disfranchisement; in the other the conviction. In the Ramsey case the Supreme Court of the United States says that a polygamist or bigamist "can only cease to be such when he has finally and fully dissolved, in some effective manner, which they were not called upon to point out, such relationship."

We have been unable to find any decision which points out "that effective manner," and are of the opinion that the point under consideration has never been adjudicated. The statute has prescribed a way by which the status of the polygamist may be changed, that of amnesty by the President (section 6, Edmunds law) which, in our opinion, is the only manner in which it can be done. In the language of Judge Zaue, "amnesty is the remission of the consequences of a crime, and may be after as before there is a conviction." (Bennett decision.)

Disfranchisement is the consequence of the crime of polygamy, and without amnesty the disability remains. The crime of polygamy is consummated and, in fact, wholly included in the act of marrying; having a wife living with or separate from his wives does not in the least affect his status. In the language of the Supreme Court "The statute makes an express distinction between bigamists and polygamists, on the one hand, and those who cohabit with more than one woman on the other."

The Ramsey case was decided under the law of March 22, 1882. The act of March 3, 1887, re-classifies the liabilities, and adds the class which we designate as class 1, to wit: Those who have been convicted, etc.

Franchise is a privilege, not a right, and one must comply with all the precedent conditions to entitle him to exercise that right. To us the law of 1887, seems very specific. Under that act we are of the opinion that any person who has since the passage of the anti-polygamy law of 1862, violated that law, and who has not been amnestied by the President of the United States, is a polygamist or bigamist, and is not entitled to vote.

Done at Salt Lake City this 7th day of February, 1889.

H. S. MCCALLUM,
R. D. WINTERS,
JOSEPH R. MORRIS.
Board of Registrars, Salt Lake City, Utah.

During the entire municipal campaign partisan spirit ran high and charges and counter-charges were freely made in the columns of the public press of irregularities and misconduct on the part of officials and of party managers, but no official or other communications on the subject requiring any action of the Commission were brought to its attention, and the Commission did not deem it proper to pay heed to articles appearing in partisan newspapers unless some definite and important charge should be made. The Deseret News at one time named one of the registrars in connection with a questionable transaction, but before the Commission had time to investigate, the charge was publicly and explicitly withdrawn as to the registrar named, and a majority of the members of the Commission were of the opinion that the general charge as reiterated, without naming the persons claimed to be engaged in the

work, was probably as devoid of foundation as the former explicit charge was confessed to have been.

The same newspaper, however, on the 6th day of February, contained an editorial headed "Questionable Sincerity," in which appeared this statement:

That two of the registration officers of this city made a trip in a special car over the Rio Grande Western and registered by wholesale gang after gang of employes found at various points between here and the Colorado line. . . . The members of the Utah Commission, it is presumed, have full knowledge of this flagrant crime.

As the Commission had no knowledge or information of any nature which would lead it to believe in the truth of the allegation, it immediately caused to be sent to the editor of that paper, a request that he "furnish the commission immediately the names of the registration officers referred to," which request, by letter dated the same day, he refused to comply with.

The correspondence appears in full in a subsequent communication received from him, which will be given later in this report.

The reason for the Commission giving any attention to a newspaper editorial, arises from the important relation which the paper and its editor holds to the so-called "Mormon Church," and party; and from the desire of the Commission to investigate the charges of irregularity, and to remove as far as possible, all cause of complaint.

The Deseret News claims for itself, that "it is the organ of the Church of Jesus Christ of Latter-Day Saints, and the authorized medium through which the views, wishes and instructions of the church authorities are expressed and given to the saints," and it is recognized as the official organ of the Peoples' party.

Its editor holds the high position in the church of counselor of the Salt Lake Stake of Zion, and member of the central committee of the Peoples' party. There was then time to investigate and act, had the request of the Commission been complied with.

In the subsequent letter referred to, it will be seen that he gives as a partial reason for not complying with the request, "the indisposition to deal justly with the Peoples' party exhibited by all who possessed power to correct the wrongs that were being perpetrated." This we can only consider as a puerile attempt to besmirch the Commission, which had in good faith and in a respectful manner invited his assistance in its endeavor to investigate, and correct any wrong that might be found to exist.

On the 1st day of May, nearly three months after the ignored request for information, long after the Commission had adjourned, after the functions of the officers referred to had ceased and too late for any act of the commission to be effective, or of benefit to any one, Mr. Penrose, the editor, addressed to the chairman of the Commission, at Des Moines, Iowa, the following communication:

SALT LAKE CITY, May 1, 1890.

Col. G. L. GODFREY, Chairman Utah Commission:

GENTLEMEN: On the 7th of February I had the honor to receive from you a communication of which the annexed is a copy:

"SALT LAKE CITY, February 7, 1890.

"MR. CHARLES W. PENROSE,

"Editor Deseret Evening News.

"DEAR SIR: In your paper of yesterday evening in an editorial headed 'Questionable Sincerity,' you make among others this direct charge, 'that two of the registration officers of this city made a trip on a special car over the Rio Grande Western and registered by wholesale gang after gang of employes found at various points between

here and the Colorado line.' And further charge, 'the members of the Utah Commission, it is presumed, have full information of this flagrant crime.' The Commission, and each member thereof, emphatically denies having such information.

"Will you have the kindness to furnish the Commission immediately with the names of the registration officers referred to in your article and oblige,

"Yours, respectfully, by order of the Commission,

"G. L. GODFREY,
"Chairman."

To this I at once replied as follows:

"OFFICE OF THE DESERET NEWS COMPANY,
"Salt Lake, February 7, 1890.

"Col. G. L. GODFREY,
"Chairman Utah Commission.

GENTLEMEN: Your favor of even date in relation to an article which appeared in the Deseret Evening News of the 6th instant is received.

"Although I never wrote or inspired the article referred to, and did not see it until it was in print, I do not wish to avoid any responsibility which attaches to me as editor of the Deseret Evening News. I therefor reply to your assertion directly.

"You say that I 'make among others this direct charge: That two of the registration officers of this city made a trip in a special car over the Rio Grande Western and registered by wholesale gang after gang of employes,' etc. I clip from the article the exact language used, as follows:

"It is believed to have come to be as well understood to every citizen as is the season of the year or the state of the weather, that two of the registration officers of this city made a trip in a special car over the Rio Grande Western and registered by wholesale gang after gang of employes found at various points between here and the Colorado line. The members of the Utah Commission, it is presumed, have full information of this flagrant crime.'

"You will observe that instead of making any 'direct charge' of the kind you mention, the Deseret News simply commented upon something that is a topic of common conversation. The charge did not originate with the Deseret News nor with any of its writers.

"It is fair to presume that the Utah Commissioners present in this city have as 'full information of this flagrant crime' as is current in the community. And I must confess my surprise at your statement that the 'Commission, and each member thereof emphatically denies having any such information.'

"I also respectfully suggest that if the Commission really desire to go to the bottom of this notorious affair there must be better means of reaching it than through newspaper channels. The names of the appointees of the Commission who are said to have perpetrated one of the most shameful attempts at fraud ever committed in the country, are bandied about by the public, and, as the Deseret Evening News has intimated, must surely have come to the ears of the Commission.

"I am, gentlemen, very respectfully yours,

"CHAS. W. PENROSE,
"Editor Deseret News."

At that time I was satisfied that the reports commonly circulated concerning illegal registration along the line of the Rio Grande Western Railway were true. But the direct evidences which have been obtained in proof of those reports were not then within my reach. Even if they had been at my disposal it is probable that I should have deemed it prudent to withhold them for a time, in consideration of the intense party feeling that then prevailed, and the indisposition to deal justly with the people's party exhibited by all who possessed power to correct the wrongs that were being perpetrated.

As the contest is now over and the bitterness it provoked is somewhat allayed, and as I think you should be informed as to some of the disgraceful facts known to many members of the people's party who consider they have been defrauded, I submit to you certified copies of a few out of a large number of affidavits which I have examined, which are bona fide, and which will be carefully preserved for future reference. The affidavits in regard to the train registration, some of which I send you, coupled with the fact that the names of the men illegally registered appear on the registration lists without any address and chiefly in the second precinct, established, in the minds of those who have well considered the matter, the assurance that three, at least, of your registration officers were parties to the fraud.

I also send you a few out of a very large number of affidavits concerning the conduct of the registrars, sitting as a court of first and last resort and depriving hundreds of legal voters of the right to cast their ballots at the Salt Lake City election.

And further, I add some samples of hundreds of other affidavits, showing that the judges of election violated the law in rejecting votes offered under the provision of section 2007 Revised Statutes of the United States.

With this information at hand I feel it my duty to place so much at least as I now send at your disposal; not, however, with the view of making this correspondence public, but that you may not, through silence on my part, be left in ignorance of the wrong that has been done to the majority of the voters of this city, and the culpable conduct of those officers of your appointment who are now enjoying the pecuniary reward of their unlawful work.

Very respectfully,

CHARLES W. FENNER.

What purported to be affidavits of several parties, accompanied the communication, but as none of the parties purporting to have made them were known to, or ever heard of by, the Commission, with one exception, the Commission had no means of knowing whether they were deserving of weight and credence, even if the facts alleged in them were worthy of notice. The exception spoken of is the purported copy of an affidavit by one James B. Ray, which is the first of the series furnished. The Commission had information of the temporary presence here prior to the election of a person by that name, otherwise known in Salt Lake City as "No. 2" of a somewhat famous body of so-called detectives employed by the people's party committee, and of which one Bonfield, of Chicago, was known as "No. 1." The information the Commission had was supplemented by the following description of him as telegraphed from Chicago, and published in the daily press of this city, without denial:

CHICAGO, February 3, 1890.

E. H. PARSONS,
United States Marshal:

James Ray; about twenty-eight years; weight, 175 to 180 pounds; stout built; 5 feet 5 or 6 inches; light complexion; smooth face; blonde hair; done three years at Indiana penitentiary for burglary; was stool-pigeon for John Bonfield for three years when Bonfield was city detective; was arrested by a Pinkerton detective at Aurora, Ill., summer of 1888, for picking pockets, and known as an all-around thief, with a general bad reputation.

W. A. PINKERTON.

The Commission is not of the opinion that affidavits made, or procured by agencies of that character are entitled to be considered as of great weight, especially when directed against men of character and standing in the community, acting under solemn oath to perform their official duties impartially, and is of the opinion that the matter should have been referred to the courts instead of the Commission, if any action had really been desired.

The municipal election of February 10 resulted in the election of the Liberal ticket by majorities ranging from 700 to 800. The majority of George M. Scott, Liberal candidate for mayor, over Spencer Clawson, People's candidate, was 807.

The Commission believes the election was a fair one, and has no doubt that the Liberal party fairly won the day.

The legislature of 1890 enacted that the elections for school trustees in cities of the first and second class should be by the registered voters of the city, and under that enactment the Commission held that the election must be conducted by officers of its appointment. On the 14th day of July school elections were held in Ogden, Salt Lake, and Provo, resulting at the former place in the choice of seven Liberal and three People's party trustees, thus giving the control of the Salt Lake City schools to the Liberals, or anti-Mormons.

In the August election, which was general throughout the Territory, for commissioners to locate university lands, and county and precinct officers, the result was again favorable to the Liberals in Salt Lake County, they electing their ticket with the exception of recorder, sheriff, and treasurer.

* * * * *

The Commission feels justified in pointing with some degree of pride to the results that have been attained through its administration of the election laws in the Territory, and in expressing the opinion that without such enactments, and the thorough and conscientious manner with which the Commission has endeavored to enforce them, such good results would yet be among the things to be hoped for, but not attained.

In addition to the duties of the Commission under the laws in regard to registration and elections by act of Congress approved October 19, 1883, the Commission was created a "Board of Management and Control of the Industrial Christian Home Association, for the Territory of Utah," and required to report to Congress in regard thereto.

Upon assuming the management of said institution it was found that the association had purchased a lot, and that the building had been partially completed under its management. A large and commodious brick building is now completed, partially furnished, and is now ready for occupancy by such persons as may under the law be eligible to become inmates, to wit, "Dependent women who renounce polygamy and the children of such women of tender age; women and girls with polygamous surroundings in danger of being coerced into polygamy; girls of polygamous parentage anxious to escape polygamous influences; and women and girls who have been proselyted elsewhere and removed into the Territory in ignorance of the existence of polygamy."

Thus far but few of any of these classes have availed themselves of the munificence of the Government by accepting the home thus generously offered them.

In compliance with the terms of the law, the direct management of the home has been turned over to the association named, but the action of the association is subject to the supervision and control of the Commission. A fuller report on this subject will be made to Congress, as the law directs.

During the year there have been frequent expressions of the hope that the church would, in some authoritative and explicit manner, declare in favor of the abandonment of polygamy or plural marriage as one of the saving doctrines or teachings of the church; but no such declaration has been made. There is little reason for doubting, so complete is the control of the church over its people, that if such a declaration were made by those in authority it would be accepted and followed by a large majority of the membership of the so-called "Mormon Church," and a settlement of the much-discussed "Mormon question" would soon be reached.

On the contrary, in all the teachings in the Tabernacle and the church organs every effort of the Government to suppress this crime is still denominated as a persecution, and those charged with ferreting out and prosecuting the guilty are denominated persecutors of the saints.

The church seems to grow more united from day to day under these teachings. At the general conference of the church, held in Salt Lake City in April last, Wilford Woodruff, a disfranchised polygamist, was chosen "as prophet, seer, and revelator, and president of the Church of Jesus Christ of Latter-Day Saints in all the world;" the first time since the death of John Taylor, in 1887, that that office has been filled.

At the same time George Q. Cannon was chosen as first counselor, in the first presidency, and Lorenzo Snow as president of the twelve apostles, all of them being disfranchised polygamists.

The council of the twelve apostles was completed by filling all vacancies. A large proportion of the twelve apostles and the high dignitaries of the church are polygamists, and all are reputed to be open believers in the doctrine. Indeed, it is believed that no one can be promoted to office in the church unless he professes a belief in it as a fundamental doctrine.

The day he was elevated to the presidency, Wilford Woodruff, addressing the conference in the tabernacle, used the following language:

We have also the book of doctrines and covenants. This code of revelation was given through the mouth of the prophet, Joseph Smith, by the arm and the mouth and otherwise. That book contains some of the most glorious and most sublime revelations God ever gave to man. * * * These things are clear, they are pointed, they are strong, and they are the revelations of God, and they will be fulfilled whether men believe it or not. * * * I say there is not a nation under heaven, there is not a king, a prince, or a president, or any other man who has power over the souls of man but should give unto their subjects the privilege of worshipping God according to the dictates of their own consciences. * * * They are not responsible to the emperors, or kings, or presidents, or governors who rule over them. * * * In view of this, can I afford to reject the gospel or to turn away from that which the Lord has required at my hands because it does not suit the world? I can not.

In another address to the same conference he said:

The Lord himself has stretched forth his hand to establish this church, his kingdom.

Again, speaking of the book of doctrines and covenants (in which the revelation on plural marriage is found) he said:

This book of revelations, like other records, will go down to the end of time and into eternity.

Again, he said:

When men shed the blood of the righteous because they follow the word of the Lord, they will have to pay for it by and by. The blood of Joseph and Hyrum Smith was shed, but the bill is not paid yet.

Again:

There has never been any change in the gospel ordinances.

Elder Gates at the same conference said:

We are now experiencing what was promised the saints fifty years ago. I heard Hyrum Smith predict the situation when he was on trial before Judge King. He said that at that time it was a State persecution, in time it would become national. I look for the time when Jehovah shall remove every barrier that stands in the way of the saints, enjoying every right and privilege the Lord designs they shall possess.

Elder B. H. Roberts said:

The kingdom is indestructible.

President George Q. Cannon said, speaking of Joseph Smith:

The Lord inspired him and gave him revelations concerning the church's temporal affairs.

And Counselor O. W. Penrose said:

A religion which is spiritual alone would not be adapted to our condition, but we need a religion which embraces both the temporal and the spiritual.

Of the Mormon people he says:

They have stood poverty, persecution, imprisonment, and adversity.

And Bishop O. F. Whitney said.

We can not outgrow Mormonism.

President Woodruff, as late as August 3, 1890, at Logan Cache stake conference, made this declaration:

We should be of one heart and mind in all matters, temporal and spiritual, that come before us in the labor of the church and kingdom of God. * * * Standing connected with us here are the twelve apostles. It is their duty to be of one heart and mind. They have no right to be otherwise; they can not be otherwise and prosper before God. They should be one with us and we one with them; they have their rights; they have their agency; but when the presidency of the church say unto any of them "this is the word of the Lord," or "this is right," they should take hold and work with us. The law of God requires this union at our hands.

President George Q. Cannon, in an interview last February, said:

We bow to the law; we obey it outwardly; surely we ought not to be obliged to declare what we believe or do not believe as the price of suffrage. Our consciences are at least our own. You must remember that the doctrine of polygamy was accepted many years ago as a revelation from God. That revelation stands; we can not wipe it out by a declaration of man. We can submit to the laws of our country, and that we are doing. It seems to me that is as much as we can be asked.

Interrogated as to whether Mormons could take the test oath honestly, he replies:

Yes; there is no question in my mind that we can take this test oath honestly. I say 'we,' I mean our people. I don't include myself, for I am one of the ultras. There are two views of this question of polygamy taken by our people. Some of us believe that the revelation is a command from God to take plural wives. I so consider it. * * * It has always been my belief that the revelation commanded polygamy. Others, and they are in the majority, do not regard the revelation as making polygamy obligatory; they consider it as permissive.

These are not the views of the layman or the ignorant man. They are words from the mouth of the first counselor in the first presidency, the prophet, seer, and revelator; the member of the church board of education, George Q. Cannon.

At the Salt Lake stake conference, which convened March 2, 1890, the same distinguished authority said:

There may be things done, and may be counsel given, that the saints can not understand. It is your duty not to be disobedient. * * * If counsel comes from the first presidency, and we do not understand it, it is our duty to go to our father and ask him to enlighten us. We have no business to stand and murmur.

He ended his exhortation with these words:

Let us be careful and not betray the secret of our strength, and thereby cause the displeasure of the Lord, and give our enemies power over us.

He was followed by Elder James E. Talmage, who said:

If we guard well our covenants and betray not the secret of our strength with the Lord, they will never be able to cope with us.

And by Counselor Joseph E. Taylor, in the same vein—

That the secret of the Latter Day Saints' strength lay with the Almighty. We could not enhance our interests by compromising with our enemies.

Bishop O. F. Whitney, addressing the same congregation, said:

In a day like this, when our rights are invaded and trampled on, and the circle around us seems narrowing, it is more difficult, perhaps, to acknowledge the hand of God than in other conditions. * * * Some day Zion will be the head and not the foot; she will not always take terms but will dictate them, and the sons of those who have persecuted her will come bending unto her, and they will not be spurned either, but will receive blessings at her hands.

It would seem difficult to reconcile these declarations with the "official declaration" made by President Woodruff, his counselors and apostles, on the 12th of December last, and it is a task the Commission will not undertake.

The church "organ" on the 11th of December last devoted a column to a laudatory obituary of David Williams, who--

As a Latter Day Saint, lived and died faithful to the obligations of the gospel, having a firm assurance of his election to a glorious resurrection. He leaves two wives, and was the father of fourteen children.

On the 6th of March, 1890, it has another on Joseph H. Smith, which says of him:

Father Smith was a most devoted saint, a wise father, and faithful husband. He leaves two wives and a numerous posterity to mourn his loss. He died in the full hope of a glorious resurrection with the just.

On the 20th of August, 1890, it chronicled the decease of Brother William A. Empey, of St. George, who was president of the thirteenth quorum of seventies, and high counselor in St. George. The report says:

He was a man of great faith and integrity, enjoyed the confidence and esteem of his acquaintances during life, and has doubtless through his faithfulness earned the boon sought for—eternal life. Two of his wives survive him, one having died some years since.

The foregoing extracts illustrating the tenacity with which the Mormon church adheres to all the tenets of the church, including polygamy, the kingdom of God on earth, the absolute power of interpretation and command resting in the head of the church, and its temporal as well as spiritual power, are all late utterances, and are all taken from the columns of the "organ" of the church, "the medium through which the views, wishes, and instructions of the church authorities are expressed and given to the Saints."

The Commission had hardly made its last annual report when one Hans Jespersen, of Utah County, was arrested on the charge of unlawful cohabitation with one Alice Horton. When the case came up for examination before the United States commissioner a clear case of polygamous marriage was disclosed, the ceremony of endowment and marriage having been partially performed in the temple at Manti, and the remainder at the endowment house in Salt Lake City, in the month of April, 1889. The evidence given by the plural wife is inserted as reported in the Salt Lake Tribune of October 12, 1889:

Alice Horton, the plural wife, was the next examined, and gave her evidence in a straightforward way. She said, in substance, as follows: I was married to Jespersen Horton in Virginia; in 1884 Horton died; she heard the Mormon elder preach in Virginia; joined the church and came to Utah in 1888, in November; went to Salem to live; from there to Payson, next to Santaquin, and then to Goshen; in each of the above places, with the exception of Goshen, she remained from four days to a week; first met Jespersen in Santaquin; went to Goshen with him; washed for a living; became better acquainted with him there; he found her a home last June; he paid addresses to her and offered his hand in marriage April 8; went with him to Manti temple; went through the temple with him; saw him in various departments; they wore temple robes; staid at Frank Farnsworth's house; they occupied the same room; he slept on the floor; she slept in the bed with her two children; went back to Santaquin, then to Salt Lake; did not go to Salt Lake together; he went first and met her at the depot; went to the temple yard before they left Salt Lake; went to the little building; don't know what it is called; had their endowments at Manti; went into the endowment house with Jespersen; understood that they were to be married, she as his plural wife; knelt at the altar; took hold of hands; heard a voice pronounce them man and wife, but didn't see any one, nor who spoke; Jespersen didn't tell her who it was; she gave him no license of marriage; they kissed each other at the end of the ceremony; they were married according to the laws of the church; didn't live together in Goshen after right along; they slept together and had the relation of husband and wife; am now pregnant; became pregnant May last. Excused.

A couple of the defendant's daughters were sworn, but gave no evidence of weight.

The case attracted great attention and caused much comment, and

the trial was looked forward to with great expectations as to its possible developments, but when the time for trial came, Jespersen pleaded guilty. The report given is from the Salt Lake Herald, a Mormon daily, of October 11, 1889.

Hans Jespersen pleaded guilty to both adultery and polygamy and asked for sentence now. He said he had married his plural wife at Salt Lake last April. Defendant said he didn't realize he was infringing on any one's rights. He said he didn't know who married him. It was at the endowment house, Salt Lake. Myself and my plural wife were the only ones there. No one gave me a recommend to go there. A man told me on the street that he thought I could go there (the endowment house) and get married. He was sentenced to five years for polygamy and three years for adultery, the sentence in each to begin and run at the same time.

Light is thrown on the present manner of conducting such marriages in the witness's testimony. She "heard a voice pronounce them man and wife, but didn't see any one, nor who spoke," and the difficulty of making proof of such criminal ceremonies is illustrated by the secrecy observed. The endowment ceremony and the marriage ceremony were performed in buildings where none can enter but by permission of the church authorities.

The correspondent of the Tribune published interviews with leading officials and members of the church in Utah County, which have not, so far as known to the Commission, been denied, and are as follows:

The Jespersen case is still the hour's sensation among all classes here. The Tribune man, thinking the opinion of the church dignitaries here would make some interesting reading, to-day called on those that could be found. Notes in answer to the reporter's questions were made on the spot, with the result, substantially, as given below.

The reporter called at the First National Bank to interview Stake President A. O. Smoot. Asked the reporter, "Mr. Smoot, in view of what John T. Caine said in Congress about polygamy being a dead issue in Utah, and the development of the Jespersen case, what have you to say about the situation?"

"I can say that I think Jespersen acted very unwisely and indiscreetly. I don't think the authorities of the church sanctioned the Jespersen marriage. If he was married at all, it is a bogus marriage. So far as I know the church authorities have repudiated the practice; not the doctrine of polygamy; therefore Caine's statement is substantially true. If plural marriages are consummated now, they are clandestinely performed, so far as I know. I didn't give a recommend to Jespersen to marry polygamously. I may have indorsed a bishop's recommend for him to do temple work. I understand that no more plural marriages are solemnized in the temple."

David John, first counselor to A. O. Smoot, in this stake of Zion, said: "I don't know anything about it, don't understand it. The case has created a regular stink, and no one in the Territory regrets the affair as much as Mr. Smoot and myself. I have never given a recommend in this or any other instance for a man to take a plural wife since the passage of the Edmunds-Tucker law. As I understand it, polygamy is practically repudiated by the church—the practice, not the belief."

S. S. Jones was seen in his office this morning buried in a bundle of business letters. He smilingly met the reporter and talked freely of the Jespersen case. Mr. Jones's plural wife is sister to Jespersen's legal wife, and, therefore, it is apparent that Mr. Jones's opinion would be of public interest. Mr. Jones says:

"As long as I live I'm not going back on my religion, polygamy included, but I've got no United States to set up on end. I'm not responsible for what Mr. Caine or any one else say. I believe in polygamy as much as ever, but the practice is another thing, just now. I'm not directing the affairs of the church; I have enough to do to manage my own business."

John C. Graham, editor of the Enquirer, hadn't heard that the practice or doctrine of plural marriage had been authoritatively repudiated by the church authorities; don't think there is anything in the Jespersen case; was perfectly astounded at it, when he heard of it. I have been under the impression that no polygamous marriages had taken place in two or three years past. If Caine stated in Congress that polygamy was a dead issue—I don't think he did, without qualification—in view of the Jespersen case, it will be an awful position for our Delegate Caine in Congress next winter.

Acting City Prosecuting Attorney W. H. King, a leading light in the people's party and the church here, held that Caine spoke truly. "There may be isolated cases," said Mr. King, "of violating the law, as the Jespersen one, for instance. I wouldn't

say that the church has repudiated polygamy, but there has been a great diminution in, if not entire cessation of, polygamous marriages. It is a dead issue in Utah, politically. I think the authorities of the church act negatively rather than otherwise with respect to the principle. I don't think the ecclesiastical authorities would recommend a man to violate the law, by entering into polygamy, and would refuse to extend that opportunity to him."

President Woodruff, in an interview published in the *St. Louis Globe-Democrat* of October 13, is reported to have said of the case:

I do not understand it at all. It is giving us a good deal of trouble. * * * It seems incredible. If it is true it is against all of my instructions. I don't understand it at all. We are looking into it, and shall not rest until we get all the facts.

The results of this "looking into it" have not yet been given to the world, and probably will not be.

The following extract is from the *Wasatch Wave*, a Mormon newspaper, and appeared editorially in June, 1890. From it one would hardly suppose that polygamy is obsolete or even dying out:

There is another side to this picture in Utah. All children born to plural wives since January, 1883, are illegitimate, and under this rule those children may be turned out into the street to starve, or beg, or make a living the best way they can. There are hundreds of children, the issue of polygamist marriages in Utah, that may be turned out—cast upon this cold and cruel world with no earthly means of support—to depend upon charity, either public or private. If the United States Government wishes to eradicate this so-called social evil, polygamy, from this Territory, the responsibility should be placed where it belongs, on the shoulders of the men.

So long as the declaration made in the epistle of the first presidency, published to the church in 1885, to wit:

We did not reveal celestial marriage; we can not withdraw it or renounce it. God revealed it, and He has promised to maintain it and to bless those who obey it. Whatever fate, then, may threaten us, there is but one course to take; that is to keep inviolate the holy covenants they have made in the presence of God and the angels. For the remainder, whether it be life or death, freedom or imprisonment, prosperity or adversity, we must trust in God—

remains unrecalled by any word from those in authority, so long may we doubt the sincerity of the oft-repeated statement that they are "obeying the laws."

It is the opinion of the Commission that nothing but a wholesome fear of the penalties of the law leads them to even make a pretense of obedience to it, and that "there has never been any change in the gospel ordinances."

The Commission is in receipt of reports from its registration officers, which enumerate forty-one male persons, who, it is believed, have entered into the polygamic relation, in their several precincts, since the June revision of 1889. Crediting them with one plural wife each would give eighty-two persons thus reported as entering into the relation forbidden by law, and said to be forbidden by the church authorities.

When it is remembered that there are a large number of communities and precincts where there are no anti-Mormons to act as registrars, and the commission is compelled to appoint them from the membership of the Mormon Church; that these reports come only from precincts where there are watchful opponents of the crime; that Mormon registrars never report the cases occurring in the precincts in which they serve, and in which plural marriages are probably most frequently entered into, and that the greatest care is observed to keep such marriages secret, so secret that the birth of a child is generally the first cause to suspect the fact of unlawful marriage, it is more than probable that only a small proportion of the polygamous marriages really contracted

are reported, and a still smaller proportion where convictions could be had even for unlawful cohabitation.

The number of cases that have come under the cognizance of the courts since September 1, 1889, involving the offenses defined in the acts concerning polygamy and kindred crimes is as follows:

	Indictments found.						Convictions.				
	Polygamy and bigamy.	Unlawful cohabitation.	Adultery.	Fornication.	Total.		Polygamy and bigamy.	Unlawful cohabitation.	Adultery.	Fornication.	Total.
First district (Provo)	3	43	21	5	78	First district (Provo)	1	44	30	3	78
First district (Ogden)	9	34	21	6	70	First district (Ogden)	9	20	7	1	37
Second district (Beaver)		22	8	4	34	Second district (Beaver)		13	2	1	16
Third district (Salt Lake)	2	15	14	7	38	Third district (Salt Lake)		11	7	3	21
Total	14	114	64	22	220	Total	10	88	40	8	152

Indictments pending in which no arrests have been made for the reason that "the defendants are either in hiding or have been sent out of the country as missionaries" are as follows:

Polygamy	4
Unlawful cohabitation	30
Adultery	4
Fornication	1
Total	39

The number of cases reported from the United States commissioners for the same period is as follows:

	Complaints.					Held to bail.				
	Polygamy and bigamy.	Unlawful cohabitation.	Adultery.	Fornication.	Total.	Polygamy and bigamy.	Unlawful cohabitation.	Adultery.	Fornication.	Total.
J. W. Greenman, Salt Lake	8	27	10	13	58	3	19	7	11	40
A. G. Norrell, Salt Lake		2	1	4	7			1	3	4
H. Pratt, Salt Lake		4	4		8		1	4		5
C. C. Goodwin, Logan		45	13	3	61		45	13	3	61
E. P. Johnson, Corinne		2			2					
J. M. Cohen, Park City			1		1			1		1
C. E. Norris, Beaver		15	1	1	17		10	1	1	12
G. C. Viele, Fillmore		4	2		6		3	2		5
J. T. Leonard, Salina		15	5	2	22		15	3	2	20
R. W. Cross, Ogden		12	2	6	20		11	2		15
W. Zabriskie, Mount Pleasant	1	3	1		5		1	1		2
Total	4	129	40	29	202	3	93	31	22	149

The Commission has heretofore made recommendations for further legislation in support of the existing laws designed to stamp out this evil, and respectfully refers to the recommendations to be found on page 18 *et sequitur*, of its report for 1889, to which it requests the attention of the law-making power of the Government, as being in its

opinion necessary and proper legislation to more effectually accomplish the desired ends.

In addition it recommends that the powers of the Utah Commission be so enlarged as to authorize and enable it to issue instructions which shall be binding upon the registrars of its appointment in the performance of their legal duties.

That the said registrars shall be made penally liable for any willful act of omission or commission on their part in respect to the discharge of their legal duties.

The Commission in its last report, in view of the fact that the constitutionality of the law known as the Idaho test oath law was then before the Supreme Court, suggested the propriety of enacting a similar law for Utah in case the decision of the court should be in the affirmative. The Supreme Court having so decided, the Commission now recommends such an enactment, believing that it would do more to put an end to the teaching and practice of polygamy than has yet been accomplished by the partial enforcement of existing laws.

It believes suffrage is a privilege that would become so prized by those disfranchised under such a law that in time it would be sought for by young men who, either from better education and more enlightened views, or from motives of worldly ambition, would begin to question in their own minds whether it be profitable to adhere to superstition and false doctrines at the cost of citizenship, and many, after doubt and reflection, would finally embrace the right and become good and loyal citizens. That priestcraft and superstition can long prevail against liberty and the civilization of the age, especially when ambitious desire for social and political standing are added to the example and teaching of the American element which now preases closely upon them, is difficult to believe.

In conclusion the Commission will repeat what it said in its last report—

That in this matter the Government and Congress should take no backward or even wavering step, but should continue the active and vigorous enforcement of the laws and the improvement of them by the amendment of such as would make them more effective, and by enacting such other laws as experience may show to be wise and more efficacious to accomplish the desired end.

Respectfully submitted,

G. L. GODFREY.
A. B. WILLIAMS.
ALVIN SAUNDERS.
R. S. ROBERTSON.

REPORT OF THE GOVERNOR OF ALASKA.

EXECUTIVE OFFICE,
Sitka, Alaska, October 1, 1890.

SIR: I have the honor to submit the following report of my official acts and doings and of the condition of the district with reference to its resources, industries, population, and the administration of the civil government thereof, for the year ending June 30, 1890.

THE CIVIL GOVERNMENT.

Alaska has a threefold legal aspect. As a judicial district it does not so much differ from other judicial districts of the United States,

though in some respects it is peculiar and the uncertainty of the application of the laws of Oregon in many cases adds very much to the perplexities and responsibilities of the judge of the United States district court, who is at the head of the judiciary in the district and by his supervision over the inferior courts in great measure determines their procedure also. For the collection of the customs and the internal revenue it varies from other collection districts mainly in its different and more difficult conditions, of which I may speak hereafter. In other respects it may properly be regarded and spoken of as a territory of the United States, though only partially organized and incomplete and unsatisfactory as a matter of course. The administration of the civil government is in the hands of the following-named officers, to wit:

Governor, Lyman E. Knapp; judge United States district court, John S. Bugbee; marshal, Orville T. Porter; district attorney, Charles S. Johnson; clerk of court, Nicholas R. Peckinpauagh; collector of customs, Max Pracht; United States commissioners, T. Carlos Jewett, Sitka; William R. Hoyt, Juneau; James Sheakley, Fort Wrangell; Louis H. Tarpley, Unalaska.

Judge Bugbee succeeded Judge John H. Keatley on the 7th day of December, 1889. Marshal Porter took the oath of office on the 1st day of October, 1889, succeeding Marshal Barton Atkins. The present incumbent of the office of district attorney followed District Attorney Whit M. Grant, being inducted into office on the 7th day of December, 1889. The office of clerk of the court was held by Henry E. Hayden during the whole of the year which this report is supposed to cover, the present incumbent taking the office on the 16th day of August, 1890. Of the commissioners, two only have held the office during the year. Judge Louis L. Williams gave up the office to his successor at Juneau on the 9th day of August, 1890, and Judge Tarpley took the oath of office and went to assume the duties incumbent upon him at Unalaska on the 28th day of February last. The above-named officers are assisted by deputies and clerks, and appointees of the governor, such as justices of the peace, constables, notaries public, policemen, etc.

These officers make up the machinery of the civil government of the Territory. Considering the anomalous condition of things, the want of communication and means of transportation in the Territory, and the fact that the different departments of the Territorial government report to the different Departments of the General Government directly, and only by courtesy to one another, it is almost remarkable that there has been no friction in the workings of the machinery, but full and hearty co-operation and entire harmony. It is also a source of much gratification to me to be able to acknowledge the hearty co-operation and cordial assistance of the naval officers stationed in these waters, in the complicated and difficult work assigned me. I wish to make especial acknowledgment of the courtesies and assistance received from Lieut. Commander Charles H. Stockton, of the U. S. S. *Thetis*, and O. W. Farenholt of the U. S. S. *Pinto*.

ADMINISTRATION OF JUSTICE.

The jail statistics for the Territory show the number of prisoners in custody on the 1st day of July, 1889, to have been 9. There were received during the year 68, making a total of 77. Of these 64 have been discharged, mostly on the expiration of their sentences, leaving 13 still in custody at the close of the fiscal year. Of these prisoners 70 were serving sentences and 7 awaiting trial. Twenty-three whites, 20 male and

3 female, 50 Indians, 43 male and 7 female, and 4 Chinamen, make the full number. The offenses committed were as follows: Murder, 1; manslaughter, 1; assault with intent to kill, 3; assault with dangerous weapons, 5; resisting an officer, 5; rape, 1; adultery, 1; larceny, 9; assault and battery, 12; selling liquor to Indians, 15; landing liquor without permit, 2; contempt of court, 3; drunk and disorderly, 17; indecent exposure, 1; insanity, 1.

United States district court held two regular and three special sessions during the year, convening twice at Juneau and three times at Sitka.

No trials were held at the November term. The sessions held after the arrival of Judge Bugbee covered, in the aggregate, fifty-eight days. On the civil docket 52 new causes were entered, 48 were finally disposed of, and 38 remain for future disposition; 4 more than stood upon the docket at the beginning of the year. Of those disposed of 26 were by judgments for the plaintiffs, amounting in the aggregate to the sum of \$77,523.41. Judgments were rendered for the defendants in 3 causes, aggregating \$1,371.16. Nineteen causes were dismissed. There were 11 causes other than criminal prosecutions, in which the United States was plaintiff, to wit: 1 for nuisance, 1 complaint in equity, 5 for ejectment from the public lands, and 4 for the penalty for importing foreign labor. Of these causes 6 were abandoned and dismissed.

The criminal business returnable to this court included thirty-eight indictments by the grand jury, one of which was for 3 persons and six for 2 persons each, and in the case of 5 respondents there were two indictments of each. The offenses classified are as follows:

Murder.....	1
Burglary.....	1
Perjury.....	1
Assault with dangerous weapon.....	1
Grand larceny.....	1
Illicit distillery.....	2
Rape and attempt to rape.....	2
Smuggling opium.....	1
Attempting to kill.....	2
Assault and battery.....	2
Destroying property.....	3
Manufacturing liquor.....	4
Keeping dance-house.....	4
Rausing an officer.....	5
Selling intoxicating liquor to Indians.....	8

Twenty-six of these respondents were tried by jury and 17 were found guilty and sentenced, while 6 were found not guilty and discharged. In three cases the jury failed to agree. Of the respondents tried, 15 were Indians, 7 whites, and 4 Chinamen. Five of the respondents sentenced to the penitentiary have been taken to the San Quentin prison.

In the Sitka commissioner's court during the year warrants were issued and returned without arrest in five cases, in two of which the failure to arrest occurred for want of transportation. Twelve examinations resulted in holding the respondents for trial. Trials in which the commissioner took jurisdiction numbered 54, as follows:

Disturbing assembly for religious worship.....	1
Larceny.....	6
Drunk and disorderly.....	14
Furnishing liquor to Indians.....	2
Assault and battery.....	23
Disturbing the public peace.....	2
Civil causes.....	3
Contempt of court.....	1
Application for discharge of poor convict.....	1
Coroner's inquest.....	1

Statement of causes in United States commissioner's court at Juneau.

Charges and nationality.	Tried.	Held.	Dis- charged.
Disturbing the peace:			
Indian.....	92		
American.....	17		
French.....	1	105	6
Russian.....	1		
Assault and battery:			
Indian.....	6		
American.....	4	9	1
Acts injurious to public morals:			
Swede.....	2	2	
Larceny:			
Indian.....	4		
American.....	3	4	3
Selling liquor to Indians:			
Russian.....	3		
Indian.....	2		
Dutch.....	1		
American.....	8	12	2
Keeping bawdy-house:			
Dutch.....	1		
American.....	4	4	1
Manufacturing liquor:			
American.....	2		
Indian.....	3	5	
Assault with dangerous weapon:			
American.....	2	1	1
Assault with intent to kill:			
Indian.....	1	1	
Rape:			
Indian.....	2	1	1
Wanton injury to water trench:			
American.....	3	3	
Malicious injury to personal property:			
Indian.....	1		
Dutch.....	1	2	
Cases tried.....			164
Convictions.....			122
Acquittals.....			15
Examinations.....			27
Civil suits tried.....			18
Inquests.....			5

An assistant district attorney and interpreter are very much needed for this court.

Disbursements by Orville T. Porter, United States marshal, for the fiscal year ending June 30, 1890.

Appropriation:	
Fees of jurors.....	\$2, 702. 00
Fees of witnesses.....	1, 932. 00
Support of prisoners.....	8, 932. 86
Miscellaneous expenses.....	1, 505. 65
Pay of bailiffs.....	264. 50
Fees and expenses of marshal.....	2, 408. 19
Total.....	17, 806. 20

The greatest hindrances to the prompt and efficient administration of justice in this district are the lack of transportation facilities, the great distances, want of means for communication, and the difficulty of securing competent and reliable juries. If a moderate sized steam-vessel were furnished the civil government for its use in the discharge of the duties and work of the several departments and under its control, these difficulties would, in part at least, disappear. It seems unnecessary to repeat what I said in my report for 1889, but the experiences of the last year have served to confirm and strengthen the opinion then expressed that provision for transportation, not now readily avail-

able, is absolutely essential to the proper administration of the government and effective enforcement of the laws.

The law prohibiting the sale and manufacture of intoxicating liquors in the Territory is a dead letter, except in its application to the Indians. Liquors of the vilest quality, it is asserted, are sold openly and in violation of the law, even to those whose families are suffering for the necessities of life. The reason assigned for the inefficiency of the law is that prosecutions would be of no avail. Grand juries refuse to indict, and petit juries refuse to convict. I presume this statement is made intelligently and is in accordance with the facts, though I am not aware of any attempt to secure convictions. A number of complaints to the grand jury at the January term, for smuggling liquor, resisting an officer, etc., were treated by that body in a way to induce the belief that they were not in sympathy with restriction laws.

Last January many of the best citizens of Juneau, apparently influenced by a desire to regulate and restrict the sale of intoxicating liquors, which they believed could not be entirely prevented, held consultation together and with the officers of the civil government, and undertook to devise a partial remedy of the evils of indiscriminate sale. It was finally proposed that the governor grant licenses for sales according to law to such persons as should deposit the sum of \$250 for expenditure, under the direction of road commissioners, upon the streets and sidewalks of the city or town where the vendor resides, the applicant to also give bonds that he would keep an orderly house and would not sell to Indians, or minors under the age of eighteen years, the license to be revoked in case of failure to fulfill these conditions, or for other cause. The only protection expected was in the support of public sentiment and the influence it might have upon juries and officers of the law. No license has yet been granted and no application made for one. Legislation which would provide more effective machinery for the enforcement of the present law, or the substitution of something more practical in the place of it, would undoubtedly afford a more satisfactory solution of the perplexing question.

I feel constrained to call attention again to the inadequacy of the provisions of the laws for the administration of justice, preserving the public peace, holding criminals for trial, and affording convenient facilities for taking oaths required by law and in the transaction of the public business in places remote from the four localities where the United States commissioners reside. There are about three hundred towns and villages in the Territory, some of which are at least 3,000 miles from the nearest commissioner, or other person authorized by law to administer oaths, and without roads or regular communication of any kind. An act of Congress authorizing the governor to appoint justices of the peace, notaries public, constables, policemen, etc., while it would not wholly remedy the evil, would do much to relieve the situation. It is now a constant question whether the acts of appointees of the governor will be sustained by the courts, and comparatively few are willing to risk the embarrassments and perhaps more serious consequences that are always possible. Besides, there can now be no compensation for services rendered or responsibilities taken.

As business increases in the Territory and new complications arise it becomes more and more urgent that something be done to relieve the embarrassment growing out of a want of laws adapted to the peculiar conditions of the country. All the other Territories, except the District of Columbia, which has a commission with especial powers, are

provided with authority to legislate for themselves. It is at least doubtful if Alaska at the present time is in a condition to successfully assume the responsibilities of self-government. We are scarcely prepared to meet the expenses of a local government or to hold elections for any purpose whatever. But if citizenship and the qualification of voters were defined and the machinery and regulations for elections furnished, many people who think such a step would be premature and of doubtful expediency at the present time would advocate it as a choice of evils. Nothing but hardship and embarrassment is possible under the policy of neglect by the National Government in the present dependence of the Territory upon it for laws and facilities for enforcing them. I do not desire to be understood as impugning the motives or actions of Congress in its treatment of this Territory, but it must be recognized that the conditions are not favorable for their giving it the attention necessary for its proper protection and the conduct of its affairs. It is remote and unexplored, and has no political influence and no representative in the legislative halls, and very few know enough about the country even to be interested in it. Hence irresponsible and interested parties make improper representations, and measures not the wisest and those not calculated to promote the general welfare of the Territory are allowed to usurp the place of measures of infinite importance to the whole country.

If no general revision of the political conditions of the Territory are thought advisable, I would advise the preparation of a few laws adapted to our peculiar conditions. To save time a commission consisting, in part at least, of gentlemen acquainted with the country and its needs might be selected to prepare a short code of special laws, to be supplemented, if thought best, by a general application of the laws of Oregon, as now; and the code thus prepared might be submitted to Congress entire, and some of the more serious difficulties now confronting us might be speedily met. The suggestion has been made to me several times, by gentlemen whose opinions carried great weight, that a commission might be appointed to act in concert with the civil government as now existing, or independent if deemed best, who should have the authority to make regulations for the Territory in minor matters that should have the force of law, those regulations, of course, to be subject to the approval of the President and Congress. Whether any better plan could be adopted is not for me to say, but I should hope for very beneficial results from the appointment of such a commission, which would do much toward meeting contingencies arising from time to time, and in its reports to the President and Congress could speak authoritatively as to matters appertaining to the welfare of the Territory.

An application for executive clemency in behalf of Sallie, an Indian woman serving a sentence for being drunk and disorderly, was made to me by Dr. Rogers, the attending physician at the jail, on the 9th day of May last, and, after carefully considering the evidence presented, I suspended the further execution of the sentence and forwarded the petition for revision to the President.

EDUCATION.

As member of the Territorial board of education and during the larger part of the year its president, I had occasion to give much attention to the schools and the educational work throughout the Territory, and I can speak of some matters, therefore, with a confidence not other-

wise possible. Fourteen Government day schools have been in session during the year, eleven of which were attended wholly by natives. These schools are as follows:

Location.	Teacher.	School.
Unalak	John A. Tuck	Native.
Ugo	John H. Carr	Do.
Kodiak	W. E. Roscoe	Do.
Afognak	John Duff	Do.
Juneau, No. 1	Miss Rhoda Lee	White.
Juneau, No. 2	Miss Cassia Patton	Native.
Douglas, No. 1	Mrs. W. E. Adams	White.
Douglas, No. 2	C. H. Edwards	Native.
Killisnoo	Miss May Ransom	Do.
Sitka, No. 1	Miss Anna D. Beatty	White.
Sitka, No. 2	Miss Gertrude Patton	Native.
Fort Wrangell	Mrs. W. G. Thomas	Do.
Klawak	Henry J. Wilson	Do.
Howcan	Miss Clara Gould	Do.

The schools at Klawak and Douglas City, No. 1, were not in session the whole year. The work of all these schools was measurably satisfactory, though the attendance was not as full as could be desired. Neither the native children nor their parents have yet come to fully appreciate the value of education, nor the necessity of regularity in attendance, while their tastes and life habits have a strong tendency to tempt them to the forests or the waters for hunting and fishing in preference to the confinement of the school-room. A mildly compulsory attendance law, with an appropriation for native policemen to insist upon their regularity at school, would be of great service. In a few cases I have been able to find natives who would serve without compensation temporarily, with the hope that an appropriation might be made at the next session of Congress. We can not hope, however, to retain their services gratuitously very long. In addition to these Government day schools the Commissioner of Education has entered into contracts for Government assistance with schools under the care of several different missions, as follows:

At Point Hope and Anvik, Episcopalian; Sitka and Point Barrow, Presbyterian; Nulato and Koffskureffsky, Roman Catholic; Cape Prince of Wales, Congregational; Bethel and Carmel, Moravian; and Metlakatla, Independent.

There were also schools in connection with other missions, not assisted by the Government, as follows: At Hoonah, Presbyterian; at Yakutat, Swedish; at Unalaklik, Swedish; at Nuklukahyet, Church of England; at Juneau, Roman Catholic, and seventeen Græco Russian churches. The Alaska Commercial Company, in accordance with their contract with the Government, maintained schools on St. Paul and St. George Islands. These with the two homes for children under the control of the Presbyterians, at Juneau and Howcan, make up the forty-eight schools reported. Neither the mission schools nor the Alaska Commercial Company's schools reported to the Territorial board and I have been able to visit only eight of them in person. Very satisfactory reports of their work have been received unofficially. School buildings have been erected at Douglas City, Kodiak, Karluk, and Afognak, each at the expense of \$1,200, and school furniture put into the Douglas City school-house at an additional expense of about \$500. The Territorial board which had the immediate supervision of the schools during the last year has been abolished and the whole local supervision committed to the

General Agent of Education, with certain local committees to assist him. This change is not regarded with favor by the people of the Territory. I am informed by the General Agent of Education that if the appropriation for 1890 will justify an enlargement of the work for the next year contracts will be made with the Swedish Society for schools at Unalaklik and Yakutak, with the Methodists at Unalaska, the Baptists at Kodiak, the Cumberland Presbyterians at Nuchuk, and the Reformed Episcopalians at Kenai. Several new Government day schools are under consideration.

COMMERCE.

The facilities for gathering statistics of the commerce of Alaska are so poor that this report will necessarily present somewhat disconnected statements, from which general inferences only can be drawn, and the figures will be in part estimates. That the commerce of the Territory is already large and important and constantly increasing in volume and value is certain. The exports consist for the most part of furs, skins, deer horns, ivory, bone, oil; gold, silver, and other valuable ores, bullion, fish and canned products of fisheries, fertilizers, Indian curiosities, berries, etc. The imports are goods of all kinds for trade with the natives and resident whites, coal, lumber, machinery, furniture, provisions, material for canning and other manufacturing enterprises, etc.

The fur trade has become a very important one, securing recognition as such throughout the whole country. The fur-seal alone would make the business and the country from whence taken famous. About 100,000 full-sized skins were taken by the Alaska Commercial Company during the year, under their contract with the Government. Probably half as many more were captured at sea and stolen by poaching vessels. A list of fur-bearing animals in this country in numbers sufficient to warrant enumeration as affording furs for export would embrace brown, black, white, cinnamon, and Mount St. Elias bears; marten, mink, fur-seal, hair-seal, sea-otter, land-otter; wolf, black and grey; wolverines; blue, white, cross, red and silver gray foxes; mountain sheep, squirrels, ground-hogs, lynx, beavers, reindeer, wild goats, moose, and common deer. The catch of whales was a little less than the year previous, but still an important item. The cod-fishing industry in Alaska, though far from insignificant, is only a tithe of what it should be. A reference to the vessels employed in the business of fishing in Alaska may give some idea of the importance of this industry in a commercial point of view, though part of the carrying business was given to the regular line of mail steamers in southeastern Alaska. And in this enumeration no account can be taken of the steam-launches, tugs, fishing-boats, and scows employed by the various canneries in the direct work of taking and preparing the fish for the market. It may be safe to assert that of this class of sea-craft each of the thirty-six canneries in the Territory has at least one steam-launch or tug, two or more scows, and ten or twelve small boats; and each ship carries its complement of boats with it. The ships employed in transportation to San Francisco and ocean work may be briefly enumerated as follows: Engaged in the cod-fishing business, 7; the whaling fleet, 9 of which are steam ships, 44; the salmon fleet, two of which were wrecked, 55; mail steamers during the year, 29 trips.

In addition to this number must be counted two or three vessels having headquarters elsewhere than in San Francisco. The salmon and cod-fishing vessels made several trips each.

The following computations and estimates give the aggregate results of my information as to the value of the exports from the Territory of Alaska during the last year, to wit:

231,281 pounds of whale bone.....	\$1,150,000
1,500 pounds of ivory.....	7,500
555,000 gallons of oil.....	17,700
625,000 codfish.....	525,000
671,000 cases of salmon.....	3,355,000
5,300 barrels of salt salmon.....	60,000
Gold (bullion, ore, and dust), estimated.....	2,000,000
Silver.....	50,000
Skins, deer, mountain sheep, and hair-seal, estimated.....	8,000
Fur-seal (estimated), 140,000.....	2,000,000
Bears, sea and land otters, foxes and other furs, estimated.....	410,000
Berries, estimated.....	2,000
Fish fertilizers, 800 tons.....	14,400
Curios, bric-a-brac, etc., estimated.....	20,000
All other exports, estimated.....	10,000
Total.....	9,840,700

No definite information can be obtained as to the value of the imports. Probably not less than 130 ships' cargoes were transported from the States to Alaska during the year. These facts of transportation, imports and exports, signify quite extensive internal traffic and exchange, and the numerous stores and trading posts through the territory confirm the inference.

AGRICULTURE AND STOCK-RAISING.

There is very little change of situation in regard to agriculture and stock-raising since my report of last year, and I see no reason for modifying the statements then made or the positions then taken. A few more cattle and horses may be seen, larger gardens have been cultivated in some cases, and the season has proved more favorable for curing hay and carrying on the operations of cultivating the soil. The same difficulty exists in the want of titles to land; the preparation of the soil to receive seed is no less formidable, and the climatic conditions peculiar to this region continue.

Very little can be said of the agricultural capacities of Alaska from experience and nothing from statistics. The Territory may be considered under three heads with regard to its agricultural resources. The Yukon Valley region has one class of conditions, the Aleutian islands and peninsula of Alaska another, and southeastern Alaska still another. In the first-mentioned region very few, if any, experiments have been made. Of the experiences of those making the experiments in the last two-named regions no records have been kept. Newspaper statements, and even so-called official reports, have been conflicting and uncertain. In fact, it is doubtful if we shall ever have any reliable data from which to judge intelligently unless systematic experiments shall be made and records kept. So long as the information is, as now, mere individual opinion, we shall never know whose opinion is of value and whose not. Ought not the Government to establish experimental stations in all these regions? It might be done without great expense by employing for that purpose institutions already established. The industrial school at Sitka might easily keep records and furnish statistics for this section. Some missionary at Kodiak or Unga might keep the record for the Aleutian region, and some person at Anvik would be favorably situated to represent the Yukon district.

Another year's observation and inquiry have strengthened my im-

pression that southeastern Alaska has sufficient land capable of cultivation for the local demands for such products as are adapted to the climate and soil, and that root crops, vegetables, berries, and hardy fruits may be raised with satisfaction and profit, and that dairies will, when the local demand is sufficient, afford profitable investment for a considerable amount of capital. Reports from the Kenai peninsula and Kodiak indicate a more extensive agricultural and stock-raising industry, in the progress of events in those regions. But the possibilities of acquiring titles to land is a *sine qua non* for the realization of any considerable progress. Dr. F. H. Bean, United States Fish Commissioner, says Kodiak Island is one of the finest grazing countries he has seen. Many cattle and sheep are now kept and these are left out during winter and still remain fat and healthy. The climate is very mild, hay is cured, and vegetables grow finely.

It is stated that there are eleven kinds of edible berries in northern Alaska and that the Yukon Valley is full of the natural foods for birds and animals. Hence it has become the breeding place for many varieties of birds, especially aquatic fowl. For miles the country is covered with myriads of geese, swans, ducks, and a hundred other varieties of the feathered tribe who feed on the wild berries. There are other indications of fertility of soil and a climate suitable for certain classes of vegetable growths and which gives promise of valuable returns for industries adapted to the peculiar conditions of the country. It is impossible, however, to speak definitely as to the resources of this region for the purposes of agriculture or stock-raising. The proposition lately made in Congress for an investigation of the Yukon Valley and its resources seems to me to be a movement in the right direction. Until the Government acts in this matter it is not likely that there will be any practical solution of the question of the value of that vast region.

SETTLEMENT OF THE PUBLIC LANDS.

On the 30th day of June, 1890, the real estate held in fee in the Territory of Alaska may be enumerated as follows:

(1) Twenty-one pieces originally conferred under Russian rule and confirmed by the treaty of transfer to the United States, consisting of twenty small lots in Sitka and one in Kodiak. (2) Certain church properties in the city of Sitka belonging to the resident congregation of the Russian church. (3) Fourteen mining claims and five mill-sites for which patents have been issued by the United States, under its mining laws, which have been extended to Alaska. Of these, six patents for mining claims and one mill-site were issued during the last year. Many more applications for patents have been filed, ten of which were filed during the last year.

It has been repeatedly asserted, officially and otherwise, and scarcely needs reiteration, that under existing laws it is impossible to acquire titles to land other than mineral lands for mining purposes in this Territory. That this state of things should most seriously retard the progress of development of the resources of the country is not strange. The evidences of the paralysis caused by it are apparent to the most casual observer. Inquiries are frequently made as to the reason why the houses, fences, sidewalks, and other structures of our towns have such a dilapidated appearance, why water is brought from the river for domestic uses in demijohns, when water-works delivering an ample supply to the consumers might be built with comparatively small cost; why roads are not constructed, the land for gardens subdued, and the spirit of improvement evoked generally. The answer is stereotyped.

"There is no encouragement for any one to make improvements of which he has no assurance that he will have the enjoyment." Some have ventured to make limited improvements upon the public lands with the expectation that legislation for our relief would not be long delayed. The towns of Juneau and Douglas City have attained to considerable proportions in spite of the discouraging situation. Buildings and improvements by private individuals in hundreds of other places have disclosed the confidence felt that ultimate relief will be afforded. But when compared with what must have been the result under more favorable circumstances, the contrast is very striking. A Territory exporting annually about \$10,000,000, requiring the constant employment of hundreds of vessels in her carrying trade, having a capital investment in her business enterprises of many millions of dollars, with resources sufficient to attract and hold thousands of enterprising people upon its shores under unfavorable conditions of uncertainty and neglect for twenty-three years, we can readily see would, under conditions of encouragement, speedily develop into thriving communities and be filled with towns and villages which would command the respect and attention of the world. Why is not this Territory accorded the privileges never before withheld, without reason, from any land claiming protection under the American flag? Who is responsible for this delay of nearly a quarter of a century in giving to American citizens the privileges of acquiring, by purchase or otherwise, titles to the land they have occupied and improved? Is it possible that the selfishness and greed of parties whose interests are better served by keeping the country a howling wilderness as a preserve for fish and game are secretly exerting an influence with members of the national Congress to prevent legislation which would promote the development and settlement of this country? Is there any other way of accounting for the fact that, somehow, all bills for the relief of this Territory are lost before reaching final action? I prefer to shut my eyes to the possibility of such baseness. But the fact remains, and we must contemplate it with such equanimity as we can command, that it seems impossible to secure legislation for this Territory which is essential to its prosperity and progress while measures of less importance are allowed to become laws. Without legitimate representation it is always possible for persons with unworthy motives to assume the role of patriotic citizens and representatives of the district, and do infinite mischief by their selfish and unfair representations.

The brevity of my suggestion last year led to misapprehension as to the thought in mind when referring to the size of farms. The areas at the foot of the mountains in southeastern Alaska suitable for agricultural purposes are comparatively small, containing from 1 to 10 square miles, perhaps.

Populations, from the very nature of the physical conditions of the country, will always reside in villages and not in remote and isolated farm-houses. If single individuals are allowed to locate large farms in the immediate vicinity of established towns like Sitka, Juneau, and Douglas City, they will have more land than they can prepare for cultivation for many years, and many men desiring to prepare and cultivate gardens or small farms will find no land near them suitable for the purpose. There is, doubtless, land enough for every person who desires it to have a farm of 160 acres, or even of 640 acres. But how much more rapidly the country will be developed if the land within a mile of an established village of five hundred or more people is divided up among them in the first instance? Why may not the provision be made in the law to allow only a fraction of their farms to be taken from

the land immediately adjoining the town, and the balance to be taken elsewhere? I see nothing impracticable in this proposition. As an illustration, Sitka has a population of perhaps one thousand six hundred people. The area of land around the town at the foot of the steep mountains may contain 6 square miles, some of which is reserved for public uses and for the missions located here. Shall the remainder of the land be taken and kept from cultivation by a few men, or shall it be more generally divided up among the people who desire it for purposes of cultivation? There are other areas of level land a few miles away, across the bay and up and down the coast, and the balance of their farms might be located there. A law giving homestead privileges, to be available under our anomalous conditions, should allow residence in some neighboring village instead of limiting it to the farm itself.

TAXABLE PROPERTY.

There has been comparatively little change in the taxable property in the Territory during the year, though business has greatly increased, and the remarks upon this subject in my last report are equally applicable at the present time. I do not care to enlarge upon the subject. If some measure of relief could be enacted by which municipal taxation could be allowed for the purposes of street building, maintenance and burial of paupers, and some other objects appealing to the pockets of charitable people, the now severe tax upon those benevolently inclined would in some measure be transferred to the whole people. But it is so difficult to secure the attention of Congress to the little details of life in this remote province that it may not be best to urge this matter.

CLIMATE.

Much misapprehension exists in the popular mind in regard to the climate of Alaska. The great extent of territory, extending as it does over more than twenty degrees of latitude and forty-four degrees of longitude, together with its varied relations to the sea and ocean currents, affords necessarily very great variety of climate. The Yukon district, including all that part of the territory north of the Alaskan range of mountains, has severely cold and long winters and very hot and short summers. A large portion of it lies within the Arctic circle. Southeastern Alaska, including the narrow strip of the mainland from Portland Canal northwestward to Mount St. Elias, together with the large group of islands known as the Alexander Archipelago, is warm and moist. This is supposed to be on account of the Japanese current of warm water flowing through the Pacific Ocean from the torrid zone along the coast of Japan and eastward until divided into two parts on striking the American coast—a portion then following southerly along the shores of Washington, Oregon and California, the other portion following the bend of the North Pacific shore and along the chain of the Aleutian islands westward again. As the warm air from the ocean reaches the snow-capped mountains of the Alexander Archipelago and the coast the moisture condenses and is precipitated in rain, and farther inland in snow during the cold season. Hence the climate of all the islands and the extended coast line is modified from the natural severity of its high latitude to an equable but somewhat rainy one. The mean annual temperature is about 45 degrees above zero and the temperature during winter seldom reaches zero. Last winter, in January, the thermometer at Sitka once indicated 5 degrees above zero and at Juneau 4 degrees below zero, which was much the coldest weather realized. The highest registry during the summer of 1889 was 69°.

and in the summer of 1890 the highest was 84° above zero. In the Aleutian district the winters are a little colder and the summers a little warmer with less rainfall, especially on the mainland, at Kenai, and on the coast of the Alaska peninsula next to Bering Sea. The coldest weather in the Yukon valley in January 1890 was 43° below zero. The temperature of tide water a little below the surface varies less than that of the atmosphere during the year, the thermometer ranging from 36° to 59°. There was no very severe frost until the 2d day of December last, at Sitka. Snow fell during the winter to the depth of 1½ feet.

SHIPWRECKS.

Ten shipwrecks occurred in Alaskan waters during the year, as follows, to wit: Whaling bark *Ohio*, in the Arctic; bark *Lizzie Williams*; schooner *Edward K. Webster*; bark *Wildwood*, at Nushegak; steamer *Ancon*, at Naha Bay; steamer *Dispatch*, in Seymour Channel; bark *Corea*, at Kalgin Island, in Cook's Inlet; ship *Oncida*, near Sanak Island; schooner *Alpha*, at Yakutat; schooner *Nellie Martin*, near the mouth of Karluk River.

A wreck was reported at Prince William Sound, but I have been unable to verify the report or learn the name of the schooner reported as lost. Quite a number of other vessels were damaged. These accidents are likely to occur with greater frequency as business increases and a larger number of vessels ply in these waters, unless new and more accurate surveys are made. The coast is a dangerous one on account of unaccountable currents and sunken rocks.

DEMAND FOR REPRESENTATION.

The people of Alaska exhibit strong feeling upon the subject of having a delegate to represent them in the National Congress, and attribute the failure to secure legislation for their relief to the fact that we have no person there who has a recognized position as such. As bearing upon this subject I submit copy of correspondence which has created some excitement here. It explains itself, and needs no comment. It is as follows, viz:

To His Excellency, Lyman E. Knapp, Governor of Alaska:

We, the undersigned citizens of the District of Alaska, believing that the time has come when we should have a Delegate in Congress, and that it is necessary that we should have one in order that the interests of the people may be advocated in Congress, respectfully ask that Your Excellency issue a call for a general election for Southeastern Alaska for a Delegate in Congress, to take place on October 17, 1890, and that said call be issued at the earliest possible moment:

C. F. DEPU,
 Supt. E. A. M. & M. Co.
 F. H. NOWELL,
 Mng'r. S. B. E. Mng. Co.
 KOEHLER & JAMES,
 Merchants.
 W. R. HOYT,
 Commissioner.
 L. L. WILLIAMS,
 W. A. SANDERS,
 Supt. Equitable M. Co.
 NELSON BROS.,
 Merchants.
 F. S. REYNOLDS,
 Supt. Silver Queen Mine.
 DELANEY & GAGEL,
 EUGENE S. WILLARD.

JUNEAU CITY, ALASKA,
 August 19, 1890.

REPLY.

SITKA ALASKA, August 25, 1890.

GENTLEMEN: I am in receipt of your favor of the 19th instant requesting me to issue a call for a general election for Southeastern Alaska, for a delegate in Congress, to take place October 17, 1890. I recognize the patriotism, the earnest desire to promote the interests of the Territory and the deservedly high standing and character of the gentlemen whose names are signed to the petition. I too have come here to make this country my home and yield to none in my desire to promote the well-being of Alaska.

I have, therefore, given much thought to the matter of your request, hoping that I might see my way clear to comply with it. But thus far I have been unable to find authority of law, or justification in conditions, for official action on my part, in the direction you desire.

The governor of the Territory has no power, or authority, except such as has been conferred by Congress, either directly or by implication, and all unauthorized acts are extra official and void. I do not believe you wish me to become a party to any action which will not be recognized by Congress as legitimate and proper. Then let us see how this matter stands. The organic act of 1884 only provides for a collection and judicial district and a partially organized Territory. There being no provision for a legislature, a legislature is prohibited. In like manner we can have no Representative or Delegate in Congress. If we need a precedent to convince us, we have only to recall the farce of sending ex-Collector Ball to represent Alaska in Congress, and the fact that his assuming a false position destroyed what little influence he might have had with members of Congress as a private citizen. I also recollect another case, perhaps from Dakota, in which a Delegate elected by the people was refused recognition by Congress and obliged to ignobly retire. Besides, if as governor of the Territory I were to issue a call for an election of Delegate for the Territory, I should be obliged to make the call general, not local. I am bound to consider the interests of every section alike, the Bering Sea region, the Yukon valley and the Aleutian Archipelago, as well as Southeastern Alaska. Then all should have an equal chance. A proclamation for an election to be held October 17, 1890, would sound rather farcical when it reached Kodiak, St. Michael, Anvik, and Point Barrow next summer.

I suppose, of course, that it is desired that I issue this call officially. As a private citizen my call would, perhaps, have just as much weight, and no more, than that of any other private citizen. But if to be issued by private citizens, it is better that the call be signed by those who approve it. I am free to confess that the proposition does not, at the present time, commend itself to my judgment. It seems to me to be premature, impracticable, and inexpedient.

No representation other than by the chosen representative of the people can be satisfactory, or consistently advocated, except as a temporary expedient. But are we prepared for an election at the present time? Are the conditions of the Territory such that an election would now fairly voice the sentiments of the people? Are not some preliminaries of legislation and arrangement necessary? Citizenship and the qualification of voters have not been sufficiently defined to avoid friction and perhaps serious trouble. The machinery so necessary for fair and honest elections is wanting. Sectional representation can be approved by no one, and yet a general election this fall, with our limited means of communication, is impossible. A partial poll on account of insufficient notification would lay the whole business open to the charge of unfairness. If a delegate were to be elected, even without being handicapped by charges of unfairness, he would receive no recognition by Congress and have no standing except as a private citizen. And last but not least, there being no provision in law for the payment of a delegate, or for defraying his expenses, it follows as a natural sequence that the person selected would be a man who has personal reasons for desiring to be in Washington, and we can readily see why one who has personal interests to be subserved should be the last person to be thought of as a public representative.

With all respect, therefore, for your judgment in the matter, and overcoming my own desire to please you, I must decline for the present, to comply with your request.

I am, very respectfully, your obedient servant,

LYMAN E. KNAFF.

MINING AND MINERALS.

A large part of the attention given to mining during the year was in the practical development of claims already located and doing assessment work to keep claims alive, though the prospector has been abroad as usual, and a large number of locations have been made. Six

patents have been received at the land-office, with cash payments to the amount of \$1,802.50, making the total number of patents actually received to this time fourteen. Ten new applications have been made for patents.

Considerable activity has been manifested, but no excitement, in connection with the various mining interests. Placer-mining is carried on in at least eight districts, viz: Silver Bow Basin, near Juneau, Sum Dum and Shuck, some distance south, Latuya Bay, on the coast north of Cross Sound, Yakutat, Kenai Peninsular, the Fish River District, on Norton Sound, and the Yukon District, including the rivers flowing into the Yukon. About 50 miners passed over the divide from Chilcot in the early spring to take the places of those who returned in the fall from the Yukon District, where it is thought there are at least 275 men engaged in the placer-mining of the region, most of whom remained there during the winter. The results of their work are not definitely known, and reports are somewhat conflicting. One report says that 120 men, wintering on Forty Mile Creek, cleaned up from \$2,000 to \$3,000 each; another says 30 men wintered on Stewart River and all did well. At Latuya Bay and Kenai it is thought that the mines have afforded rich yields. Great expectations were announced as to the Shuck and Sum Dum regions, since which time very little has been said about them, from which it may be inferred perhaps that the expectations have been moderately realized. The Silver Bow Basin placers which have been worked have yielded satisfactory returns. A consolidation of a large number of claims in the Silver Bow Basin Mining Company, F. H. Nowell, manager, has reduced the number of separate concerns, but has not diminished the amount of work done. This company is digging a tunnel under the mountain to tap the pocket of the basin from below, and the work has been pushed vigorously and systematically. Relays of workmen keep the rock moving night and day, summer and winter. It is thought the tunnel will be through to its first opening by December next. This enterprise is considered an assured success. The character of the deposit is known, and the improved method of securing the gold will facilitate the work and enhance the profits.

Quartz lodes are worked in ten or more districts, some of which are large and contain many distinct claims. The ten districts referred to are as follows, to wit: Sheep Creek region, which affords ore containing silver, gold, and other metals; Salmon Creek, near Juneau, silver and gold; Silver Bow Basin, mainly gold; Douglas Island, mainly gold; Fuhter Bay on Admiralty Island, mainly gold; the Silver Bay mining district near Sitka, gold and silver; Berner's Bay, in Lynn Canal, mainly gold; Fish River, mining district on Norton Sound; Unga district and Lemon Creek. Many of the ores containing silver and other metals, notably the Sheep Creek, Salmon Creek and Lemon Creek ores, are sent to smelters long distances away for reduction, the necessary conveniences not being found near at hand. Some of the ores are simply piled up waiting for future opportunities, or the erection of mills. The number of mills for crushing the ore and obtaining the free gold, within the Territory, is, I believe, thirteen, only one or two of which have chlorination works to reduce the sulphurets. The mills may be enumerated as follows:

	Stamps.
On Douglas Island, the Alaska Treadwell Gold Mining Company.....	240
The Bear's Nest Company.....	80
The Alaska Union Mining Company.....	120
The Mexican.....	10

	Stamps.
In Silver Bow Basin,	
The Equitable Mining Company.....	10
The Takou Consolidated	10
The Webster Mill.....	5
Archie Campbell's Mill.....	10
In Fuhter Bay, Admiralty Island, Willoughby's Mill.....	10
In Berner's Bay.....	5
In Silver Bay District, Sitka, Stewart's Mill	10
Lake Mountain Mining Company.....	5
In Fish River mining district.....	10
Total	525

The Treadwell mill is said to be the largest stamp mill in the world. It has 240 stamps, 96 concentrators, 12 ore crushers, a 500-horse-power water-wheel, and all the conveniences for reducing the ore with the least expense. The ore is low grade, yielding from \$6 to \$12 per ton, but it is convenient to tide-water and the expenses have been reduced to a minimum. The capital stock of the company is divided into 100,000 shares. The first dividend was paid in August, 1885, and was 25 cents per share. Since that time the record of dividends may be tabulated, as follows :

Years.	Dividends.	Amount.
1885.....	3	\$75,000
1886.....	3	75,000
1887.....	5	125,000
1888.....	3	75,000
1889.....	12	300,000
Total	26	650,000

It is not supposed that these dividends represent the measure of profits, for much of the earlier earnings was put back into the business in adding to the facilities. About \$15,000 were expended in development work upon the mines of Sheep Creek during 1889, and considerable ore was taken out and transported to San Francisco for reduction. Sixty tons of ore from the Silver Creek mine gave an average return of \$200 per ton. The smelting returns show that the lowest grade of ore shipped, which came directly from the surface workings, ran 66 ounces of silver and \$4 in gold to the ton, while the first-class ore gave returns of 341 ounces of silver and \$22 of gold. In many of the mines the work of the last year was mainly preparatory to future operations, consisting of excavations, tunneling, road building, etc.

Southeastern Alaska was divided into three recording districts by order of the United States district court on the 6th day of February, 1888. The recording for the Sitka recording district is done by the clerk of the court, who resides at Sitka. The recording for the Juneau district is done at that place by the United States commissioner residing there, and the United States commissioner at Fort Wrangell has charge of the recording in the Wrangell district. All mining claims are filed in the recording district where located, but patents must be sent to the land office, which is at Sitka.

Of the other minerals than gold and silver all discussions must be based upon surface observations, except to a very small extent in regard to coal which has been taken out in comparatively small quantities at Killisnoo, in Kachekmak Bay in the Kenai Peninsula, at Unga, Port Muller, Yakutat, Murder Cove on Admiralty Island, and Cape Lisburne. And these places can scarcely be said to have been worked.

They have only been prospected. The coal found thus far is generally soft, pitchy, and bituminous, though the Kenai coal is reported to be lignite. The Killisnoo coal is generally of the character mentioned, but one claim that has been worked to quite a depth during the last year by Messrs. Brady and Whitford is thought to afford a coal having better qualities and which is especially valuable for coking purposes. All the coals of Alaska are free burning coals. The products of the Port Muller mines are said to be better suited for steaming purposes, being harder and more enduring than most of the coals of the territory and quite free from sulphur. Vessels running short of coal frequently take on supplies from the surface outcroppings at Cape Lisburne, at Unga and at Kenai, though the coals obtained at these places are not first class steaming coals. Indications are abundant of valuable deposits in other places, especially on Sullivan, Kuiu, and Revilla-Gigedo Islands and in the Yukon Valley. The main land deposits have not been investigated at all.

Marble deposits are frequent on Admiralty, Prince of Wales, Long, and Baranoff Islands, and have been observed in many places upon the main land. No surveys have been made and no careful observations taken, so far as I know. The Halleck stone has been used for the manufacture of lime, producing an excellent article, and small specimens of the deposit near Killisnoo have been cut and found to receive a fine polish. From personal observations of many of the locations and specimens, I am satisfied that if sound stone can be obtained from anywhere near the surface, profitable business will eventually grow up at several points. Whether skilled experts can judge from surface indications as to the soundness of the rock beneath, I am unable to say. But with two or three exceptions the outcroppings do not indicate soundness to the uninitiated. At Shakan there is a magnificent exposure of white and dove colored marble which appears very much like the bared surface of the rock at the Vermont quarries. The texture of the stone is all that could be desired. The location is very fine, being near tide water, in a fine harbor, and with plenty of water power near by for cheap manufacture. A careful survey by competent judges might determine the value of this deposit without much expense in development work.

A hasty examination from a row-boat, along shore in Taiya Inlet, disclosed what appeared to be a valuable deposit of granite in a position to be very accessible and easily worked. Granite and porphyry largely compose the smooth worn pebbles and small stones of the Chilcat River for 25 miles up from its mouth.

On several occasions at places quite remote from each other, I have found specimens of jade, among the natives, but in no case was I able to learn from them where the specimens were obtained. Their manner, when inquiries were made, gave the impression that they were unwilling to give information.

Native copper and copper ores, taken from the region about Copper River, are on exhibition, though but little is known of these deposits. The natives have frequently brought down to the coast pieces of pure copper, knives and bullets of the same, since long before the American occupation of the country. Barusite, a sulphuret of copper, seems to be quite abundant. The Chyittyto and Chyittyne Rivers, branches of the Copper, have both furnished fine specimens of native copper. Late last fall some very rich, grey copper ore was found about 50 miles south of Juneau. This ore also contains silver. Flint and pyrites are considered valuable minerals by the natives, who use them instead of matches for kindling fires.

FISHERIES.

An enumeration of the food-fishes of Alaska would include most of the specimens of the ichthyology of North America. Those most in use at the present time are the following, to wit: salmon, halibut, cod, herring, black bass, sea and brook trout, red fish, oolichon, capelin and anchovy. All classes, white and native, use these, in their several varieties, freely. The natives, in addition to the foregoing, use the octopus, porpoise, whale, shark, dogfish, hair and fur seal, and many other kinds.

As an industry, salmon fishing is the most important and perhaps no other salt-water fish suits the palate of so many people all over the world. It certainly forms an important item in the subsistence account of all classes in this country. Every native family lays by his store of dried salmon and halibut for winter's use, perhaps not less than 500 pounds each, and their diet is varied by fresh salmon in the season of it, and other varieties of fresh fish when the salmon are not running. The number of salmon canneries in operation during the last year in the Territory, which with their equipments represent a capital of more than \$4,000,000, was thirty-six. Their pack amounted to the enormous sum of 702,993 cases of four dozen 1-pound cans. A comparison with former years will afford a better illustration of the growing importance of the business than can be afforded by any other statement. The record stands as follows:

Year.	Total pack (cases).	Year.	Total pack (cases).
1883.....	36,000	1887.....	196,300
1884.....	45,000	1888.....	439,200
1885.....	74,800	1889.....	702,993
1886.....	120,700		

The record for the year previous to 1889 may have included only the exports to San Francisco. I have embraced in the total pack for 1889, in addition to the number of cases sent to San Francisco, which was 652,993, also those sent to Portland and Astoria, Oregon, some 18,007 cases, as well as about 50,000 cases destroyed in the shipwrecks of the *Ancon* and *Wildwood*. The total value of the pack for 1889 was about \$3,514,965. This amount increased by the value of 1,386,000 pounds of salt salmon, some \$69,300, and about 5,000,000 pounds of dried salmon put away by the natives for home consumption, some \$250,000, and we have a total of \$3,834,265, as the value of the cured products of this one fish industry. It has been before mentioned that this industry gives employment to 55 vessels used for purposes of transportation to and from San Francisco, some 36 steam-tugs, from 70 to 100 scows, and perhaps 360 small boats, engaged in the direct work of preparing the fish for the market; besides, the Pacific Coast Steamship Company's large ships made 29 trips from the sound to Alaska and return, heavily laden with freight, in part made up of supplies for and the products of the canneries of southeastern Alaska.

Seven vessels with their accompanying small boats were engaged in the cod-fishing business for the San Francisco market, mostly in the banks about the Shumagin group of islands, catching 925,000 fish, of the total estimated weight of 9,250,000 pounds, of the value of \$555,000. There was no attempt to fish systematically in the immense cod banks of the Fairweather Ground, about Kodiak, in Bering Sea, or in Revilla Gigedo Channel. It is safe to predict a business in this line, within the waters

of Alaska, in the near future, exceeding that now carried on in the Atlantic Ocean. While the salmon fishing is carried to the extent of wise economy, perhaps, the cod-fishing might, without detriment, be increased indefinitely.

Forty-four vessels with a capacity of 12,963 tons, 9 of which were steamers, were engaged in the whale fisheries in the Arctic Ocean last year. The U. S. S. *Thetis*, also cruised about in those waters to be ready to render these vessels any assistance which might be needed. The total catch of this fleet yielded 12,834 barrels of oil, 231,981 pounds of bone, and 1,500 pounds of ivory. The catch this year is expected to very much exceed that of last year. The bark *Northern Light* has captured the largest whale on record during the last twenty-five years. They took from its carcass 3,000 pounds of bone, and about 170 barrels of oil. The bone alone is worth \$15,000.

Very little attention has been paid to halibut fishing, though these fish are abundant through the whole extent of our shores and inland passages, and of the finest quality. Some have been sent to the market fresh, but the demand is not yet sufficient to command the conveniences for transportation necessary to lay it before the consumer in the best condition. It is only a question of time, however, when this fish will become an article of extensive export. It is already much used for home consumption, and is of great value because it is taken at all seasons of the year. To a limited extent salted halibut has been shipped from southeastern Alaska. I can furnish no statistics.

Herring in large quantities have been salted and shipped in kegs, and the Alaska Oil and Guano Company, of Killisnoo, made 160,000 gallons of oil and 800 tons of fish fertilizer last year from these fish. They resort in immense schools to the quiet waters of Sitka Bay and other sheltered spots for the winter, and thousands of porpoises, sharks, and other large fish follow them there. Millions of birds constantly hover over waters where they are during the winter to prey upon them. In some places schools of herring, about the size of sardines, afford fine opportunities for the location of sardine packing establishments, but none of these opportunities have yet been utilized.

That the seal fisheries are not confined to the catch upon the Pribyloff Islands, where 100,000 only are allowed to be taken, is well known. Of those captured by the revenue-cutters because illegally taken in the waters of Alaska during the year, 2,468 skins were sold in May last by Marshal Porter for the round sum of \$24,256, and it was claimed that more than 20,000 skins were successfully carried away by the pouchers to Victoria. A large number of skins, including many hundreds of pups, were taken, as it is claimed, legitimately, in the North Pacific Ocean. The natives, and many whites also, engage in the business of sealing every season along the coast, in the track of the seals on their way north to their breeding places in Bering Sea. From the nature of the case, it is impossible to obtain statistics of the amount of this irregular business.

The importance of protecting the fishing business in Alaska by effective legislation is more and more apparent every year. In many places the salmon fishing is overdone, and in many more unwise and destructive methods are employed. So far as the business enterprises of the white people are concerned, it matters little perhaps. But with the natives it is different. They are bound to their local resorts and the fishing grounds and habits of their ancestors by strong ties. They know no other way of life, no other means of subsistence.

The interior Indians, if deprived of their salmon supply for winter use,

would suffer seriously and perhaps be in danger of starvation. I have endeavored to protect the natives as far as possible, and in a few instances have had occasion to defend them against the invasion of their rights by white men. On the other hand, more frequently, perhaps, by reason of their ignorance and failure to comprehend just what their rights were, they have been the aggressors and made extravagant claims, and I am happy to be able to state that in most cases the white people have been very forbearing and have gone more than half way in taking conciliatory measures, and less friction has occurred than might have been anticipated.

THE PUBLIC BUILDINGS.

The Government owns all the buildings occupied as offices by the Government officials, and for the most part those used as residences. These buildings are old and very much dilapidated and in need of repairs. Several buildings have passed beyond the stage of profitable rehabilitation, and have been abandoned to the ravages of time and decay. The old Russian governor's house, known as the "Castle," has become a spectacle to bring sadness to the hearts of all those who have heard the narratives of its former magnificence and its historical associations. It is a log structure, and the foundation timbers decaying have caused it to become crippled and unsightly. It might still be saved by immediate repairs, but will soon be past redemption. It is not needed for present official uses, but might be put into condition for living purposes for the Government officers. Whether such an outlay as would be requisite for the purpose would be considered advisable, I do not assume to say; if not to be repaired it might be sold with the site upon which it stands, for quite a snug little sum of money. This, however, could not be done until legislation is had authorizing the acquisition of titles to land in Alaska. The repairs now in progress upon the warehouse and wharf, under the supervision of Mr. Frank Grygla, of Washington, are timely and a source of great satisfaction to the people here. Since the Government took possession of the wharf, the old system of charging an enormous wharfage from every citizen receiving freight over it has continued, but just why it is difficult to see. The policy of the Government, as exemplified elsewhere, does not seem to be thus exacting. The Ohio Falls Canal, at Louisville, Ky., will serve as an illustration. The Government purchased that canal of a private company at great expense, and opened it for the free use of the public. So with other Government works. Why should there be discriminations against the people of Alaska? Attention has heretofore been called to the need of marine barracks and a court-house at Juneau, and I believe steps have been taken to supply the same, much to the gratification of the people of the Territory.

POPULATION.

The people of Alaska have been spoken of as Americans, Russians, Hydahs, Tsimpscans, Thlinkets, Aleuts, Innuits or Eskimos and Tinnahs, or Athabascan Indians. Eight distinct languages and several dialects are spoken. The Tsimpscans embrace only the settlement at Metlakahltla, about one thousand people who came over from British Columbia with Mr. Duncan. The Hydahs have some five or six villages on the south end of Prince of Wales Island with about nine hundred people. The Thlinkets reside in from forty to fifty villages in the Alexander Archipelago and along the coast from Cape Fox to Copper River. All these have become partly civilized by contact with the

whites and through the influence of schools and missions and there is a large number of these who can speak English and have become excellent citizens. The Aleuts are also partly civilized, but with a civilization conforming more nearly to that of the Russians than our own. These reside upon the islands of the Aleutian chain, the Shunagie and Kodiak groups, the Aliaska Peninsula and the islands of St. Paul and St. George in Bering Sea.

There are a few Aleut half-breeds in Sitka. Many of these people talk the Russian language. The Innuits and Tinnehs can not be said to be civilized, though their barbarism has been modified by contact with white people. The Innuits reside along the coast from Nushegak, in Bering Sea, to the eastern limit of our dominion in the Arctic region. Lieutenant Ray speaks of them as living in a state of anarchy, making no combinations, offensive or defensive, having no punishment for crimes and no government. Given to petty pilfering, they make no attempt to reclaim stolen property. They are social in their habits and kind to each other. These people are obliged to devote all their energies to procuring the necessary food and clothing to maintain life. Their intelligence is of a low order and the race is apparently diminishing. Physically they are strong and possess great powers of endurance.

The Tinnehs occupy the interior, the Yukon valley, except the portions near its mouth, and come down to the sea-shore only at Cook's Inlet. They are called "Stick" Indians by the Thlinkets. These people have many traits of the North American Indian elsewhere, and may properly be designated as Indians. The other natives of Alaska are not true Indians and have not generally been treated as such by the government. They have no real tribal relations, though formerly the heads of families were recognized as chiefs and called such.

At the present time, among the Hydahs, Tsimpseans, Thlinkets and Aleuts, the so-called chiefs have very little if any, power, or influence, as such. Among the Eskimos, it may be doubted if the office ever amounted to anything.

The progress of the natives of Southeastern Alaska towards civilization is steady and certain, though it must not be supposed that these people yet take high rank in learning, intelligence or morality. The educating and elevating influences of the schools and missions, though doing much, perhaps more than we should expect under the circumstances, must be continued a long time in order to effect anything like satisfactory conditions. Sensational writers, inditing their effusions from the decks of steamers passing through our waters and drawing upon their imaginations and the statements of ignorant and irresponsible persons willing to interest them at the expense of truth, have done much to mystify and confuse the opinions of the reading public upon the condition of the natives of Alaska, and a few words upon the subject may not be amiss in this connection.

CONDITION OF THE NATIVES.

In some respects the physical condition of the different native tribes is alike and in others not. All are strongly built, rather short, and by their habits of living inured to hardship and endurance. The men have very light or no beards, and frequently trim the scattering hairs on their chins closely, or pluck them out. The average height is less than that of Europeans. They have an Asiatic cast of features and the coast people are generally thought to have originated from Japanese stock. The Eskimos have a language very similar to the Eskimos

of Labrador and almost identical with a small population upon the Asiatic side of Bering Strait. Physically they differ from the Eskimos of Greenland and Labrador, being more robust and healthy. All of the natives of Alaska have small and delicately formed hands and feet and rather a massive head, straight black hair, dark eyes, high cheek-bones and a nut-brown complexion. All are to a large extent fish eaters, though the Tinnehs living in the interior, or Ingalik tribes of the Yukon, are compelled to subsist to a greater extent upon game and land products.

Their dwellings, not so unlike originally, have now become quite different in style and manner of construction. Those residing in South-eastern Alaska have frame or block houses wholly above ground, with sleeping apartments partitioned off from the main or living-room where the central fire-place is located, like the state-rooms of a river steamboat, and many of the Thlinkets have substituted the modern cooking stove and pipe for the fire-place, and open chimney hole in the roof. Mr. Duncan has, wisely as it seems to me, retained the ventilation principle of the open roof in all the dwellings in his model settlement at Metlakatla, though greatly improving it by constructing a metallic bell-shaped chimney which is suspended from the roof, the bottom of the bell being about 7 feet from the floor.

These people are all self-supporting; the Hydaha, Taimpseans, Thlinkets and Aleuts living comfortably with plenty of food and blankets. The Eskimos, especially those of the Arctic region, have a hard time of it to keep from starvation and death by freezing. The Tinnehs, or Ingaliks, have less of the conveniences, not to say luxuries of life, than any of the coast tribes. The last-named two tribes have small, poorly built, partly underground houses, and their winter dwellings are entirely covered with earth.

The prevailing diseases among the coast people are consumption, rheumatism, syphilis, and scrofula. Epidemics of erysipelas, small-pox, measles, and whooping-cough also occur and constitute a standing menace to the whole population of the Territory. "Venereal disease is so common," says Past-Asst. Surgeon H. B. Pitts, U. S. Navy, who has been stationed here for some years and had much to do with the natives, "that they have come to consider it as a necessary, or at least unavoidable evil." Neglected, like other diseases among them, the results are terrible, both with the present generation and to their posterity. They manifest an unaccountable apathy as to health and even life itself, while exercising intelligence and forethought in all the minor details of their everyday life. The women frequently die in childbirth, or are rendered martyrs to constant suffering for the remainder of their lives because of neglect. The doctor further says:

The nakedness and filth, the wretched poverty and lingering sufferings of some of these poor creatures are awful to contemplate. They live in huts which afford next to no protection from the weather, or are crowded into the most uncomfortable corners of better houses. They eat such scant food as may be donated by their more fortunate friends and their drinking water is contaminated by drainage from cess-pools and grave-yards.

In 1886 Dr. Pitcher took similar views of the situation when he said:

Consumption is the natural enemy of the Alaskan Indian. Bright's disease exists to a certain extent and gonorrhea is frequently met with. The disease most to be dreaded is syphilis, handed down as it is from generation to generation, making itself terribly apparent in the shape of necrosed bones, scrofula, foul ulcers, enlarged lymphatics and tritis which soon destroys the sight.

All agree that something ought to be done by the Government to mitigate these evils. How shall this naturally fine race be saved from ulti-

mate extinction? Dr. Fitts, well says: "It would not be sufficient to provide free medicine and medical attendance," for better shelter, food, clothing, and nursing, as well as compulsion to submit, would be absolutely essential to adequate results of medical treatment.

A course of hospital treatment would probably prove efficacious for the eradication of these diseases, and no other method, so far as I know, has ever been suggested as adequate to remedy the evils referred to. The hospital was suggested by Dr. Fitcher, and is urged by Drs. Fitts and Arnold, and every other person informed of the condition of things here, and having the welfare of these natives at heart. The missionaries of the Yukon, and Bering Sea regions express themselves strongly on this subject. Under the old Russian regime, which we are accustomed to think lacked some of the elements of civilizing power, there was at least a freer expenditure of money for the humane purposes of guarding human life and health. In 1860 four hospitals with 14,550 patients were reported, though I presume this number includes every person to whom prescriptions were given.

The waters of the sulphur hot-springs of Sitka, Hoonah, and other places in the Territory are thought to have curative properties for the more prevalent diseases, and hospitals located at these points would be measurably central and convenient. Whether these hospitals should be entirely free or not may be a question. The Thlinkets, Hydahs, and Aleuts are quite generally able to pay small sums for their keeping, though sometimes not. But the main expense should, undoubtedly, be borne by the Government. The need of this additional appliance for the promotion of the physical and moral well being of the natives is so urgent that I am tempted to enlarge upon it with a more extended discussion, but refrain from indulging further because its importance is so evident that suggestion only is necessary. For mortuary statistics see Dr. Arnold's report in Appendix.

The moral condition of the natives of Alaska is undoubtedly sad enough, though there are rifts in the clouds which afford glimpses of better things ahead. Bad as their morals are, the moral degradation and obliquity of these people have been much overdrawn. Having heard of statements being made by persons of standing and character to the effect that "medicine men tear with their teeth and eat the flesh of dead men," "women slaves are killed and buried under the corner-posts of the houses newly erected," "the natives practice female infanticide as a religious duty," and allegations of the frequent occurrence, in public, of practices too vulgar and obscene for narration here; having heard of these statements I took occasion, on my recent cruises in Southeastern Alaska, to inquire into their truthfulness. I had with me, part of the time, a native interpreter whom I trusted fully. I found occasionally legends of some such things that had happened "long time ago," but the oldest people remarked, "that was when I was very young."

I came to the conclusion that the killing of slaves had never been a practice, but only a crime, like the Whitechapel murders of London; that female infanticide never was general, and had entirely ceased for many year past, except as it sometimes occurs among so-called civilized people; that the roasting, drowning, and burying alive of persons suspected of witchcraft, if practiced at all among the Thlinkets, where the practice was especially located, was exceptional. The practice of "tying up" persons suspected of witchcraft is of recent date, but could not be safely indulged in at the present time anywhere along the coast. It is now practiced only when it is thought detection is impossible. Very

few Shamans now openly practice their sorceries in this part of the Territory.

The savage nature of the natives is not wholly eradicated from many of the older men, but the presence of a war-ship seems to be all that is required to keep them in a docile condition of mind. The young people seem to be growing up with different ideas of life and its duties. They have higher aims, a taste for better living, a desire to conform to American customs. The influence of schools and missions and church services has had much to do with this transformation in the native mind.

MISSIONS AND CHURCHES.

The Græco-Russian church has been established in Alaska many years, and has been an active force during the latter part of its existence, at least among the Sitka tribe of Thlinkets and the Aleuts. At this time they have 12 churches with resident ordained priests, 67 chapels in the immediate charge of unordained assistants, 17 parish schools, and about 12,000 members in regular standing, within the territory of Alaska.

The churches are located as follows: At Sitka, St. Michael's cathedral, 1 chapel, 1 school; Killisnoo, 1 church; Kodiak, 1 church, 1 school, 8 chapels; Kenai, 1 church, 1 school, 7 chapels; Belkofsky, 1 church, 1 school, 9 chapels; Unalaska, 1 church, 1 school, perhaps 20 chapels; Nushagak, 1 church, 1 school, perhaps 15 chapels; St. Paul's Island, 1 church; St. George's Island, 1 church; Atka, 1 church, 1 school; Attu, 1 church, 1 school; Michaelofsky, 1 church, 1 school, perhaps 7 chapels. The chapels are within the district of which the churches are the headquarters, or center, and the priest of that church has general supervision of the district.

The Presbyterians have seven important mission stations, at Fort Wrangell, Hoonah, Howcan, Juneau, Haines, Sitka and Point Barrow. The native Presbyterian Church at Sitka numbers about 300. The Industrial Training School has about 170 students and 21 teachers. There is also a white Presbyterian Church at Sitka.

The other missions are as follows, viz: Friends, at Douglas City; Methodists, at Unalaska and Unga; Baptist, at Kodiak and Afognak; Episcopalian, at Anvik and Cape Prince of Wales; Swedish, at Yakutat and Unalaklik; Moravian, at Bethel and Carmel; Church of England, at Nuklukahyet and Buxton; Congregational, at Point Hope; Reformed Episcopalian, at Kenai; Independent, at Metlakahla; Cumberland Presbyterian, at Nuchuk; Catholic, at Juneau, Wrangell, Sitka, Nulato, Leatherville, and St. Michaels.

The mission movement, except the Russian Church, may be said to have been begun since 1878, and the results of their work are much greater than should have been expected. The loose and impatient assertions sometimes made that mission work among the natives of Alaska amounts to nothing, that the native children by going to school only acquire more power and skill for deviltry, or that those who have been educated in the mission fall right back into their old ways just as soon as they leave the school, are not justified by the facts. The improvement in the lives of the children is reflected and produces a less measure of improvement in the family, like the reflection of the rainbow upon the clouds.

The missionaries and teachers can always be relied upon for co-operation and help to the civil government in its work, and as such

helps, are valuable agencies for good. I believe them worthy of all the encouragement and aid which the Government can legitimately give them.

TRANSPORTATION AND POSTAL FACILITIES.

The regular and distinctively public lines of transportation in Alaska are limited to the Pacific Coast Steam-Ship Company's line from San Francisco to southeastern Alaska, the small steam tug carrying the mail from Fort Wrangell to Shakan and Klawak, and possibly, in a limited way, the Alaska Commercial Company's steamers plying between San Francisco and Michaelofsky, or St. Michaels, as it is more commonly called. The Pacific Coast Steam-Ship Company's steamers made twenty-nine trips last year, carrying the mails on contract with the Government, usually touching at seven places though not always, and occasionally delivering freight and mails at ten or eleven places. The Klawak steamer touches at three places making twelve trips, but has a very limited capacity for freights and passengers. It is doubtful if the Alaska Commercial Company can be considered as having been a common carrier, though they were very accommodating to all who desired to take passage with them and never refused to carry mail matter for the convenience of the isolated settlers of the Northwest and cruisers in Bering Sea and the Arctic Ocean. The various sea craft plying the waters of the North Pacific and Bering Sea on their private enterprises, have very kindly lent a helping hand whenever needed. The opportunities open to the general public for travel in the territory, except by the favor of private parties, or the special charter of boats for the occasion, is limited to the few places above referred to.

By the courtesy of the Navy Department, I have been personally favored with transportation, upon the U. S. S. *Thetis* and the U. S. S. *Pinta*, to all parts of southeastern Alaska, and availing myself of the opportunities, I have visited a large proportion of the waters, islands, rivers, towns, and villages, mines, canneries and fishing establishments, schools, etc., of this part of the territory. These vessels could not, however, convert themselves into transportation boats and I was allowed to take with me only an interpreter. I consider that these cruises have been of great value to me and I trust the information I obtained will be serviceable in my work while remaining in the territory.

There are eleven post-offices served with mail within the district, though some of them at rather infrequent intervals. Sitka, Juneau, Douglas and Wrangell, receiving mails from the States twice a month.

There is a strong feeling, not without reason, that Alaska is not fairly used in this limitation of her mail facilities.

With a resident population of nearly 40,000 people living in about 300 towns and villages scattered through a territory containing 580,000 square miles, Alaska ought to have more facilities for communication than were required for her accommodation twenty-three years ago when her one business company desired only to traffic with the natives for furs, and the entire population were unable to read or write. Fully nineteen-twentieths of our towns, villages, and business establishments are absolutely cut off from public mail communication with their territorial and national capitals. In these villages are located 43 schools, 47 important missions and churches, 14 saw-mills, 14 mills for crushing ore, 36 canneries and many salteries and other business establishments employing skilled and intelligent workmen. The district has a civilized

and educated population of not less than 7,000 people, and more than as many more of the people are partially civilized.

Not only the people and the business of the Territory demand better postal facilities, but the Government, to be efficient and to exercise its functions as such, must, have means of communication with the whole Territory. The organic act provides for the appointment of a governor and charges him with the duty of seeing that the laws are enforced, and with the interests of the United States Government that may arise within the district. He is then placed upon one of its eleven hundred islands without facilities of any kind, except those above mentioned, for communication with the territory in his charge.

Formal application was made to the Postmaster-General, by the officials, civil and naval, last fall, in behalf of the people of the Territory and themselves, asking that a mail route be established between St. Michaels and Sitka and intermediate points, with four annual trips between Sitka and Unalaska and two between Unalaska and St. Michael's during the eight months of the year most suitable for travel. Accompanying the application, or following it, was sent a proposition from reliable parties offering to enter into a trial contract to carry the mails according to the request, for the term of one year, at rates which seemed to be entirely reasonable and much lower than should have been expected. To this petition no direct response was made by the Postmaster-General to the petitioners. In reply to Senator Dawes and other Senators who gave the proposition their indorsement, it was promised that the question of extending the service should be carefully considered as soon as the appropriation for that class of service would justify. Perhaps action has already been taken to give us such mail service as is necessary to meet the requirements of the Territory, but I have heard nothing further in regard to the matter, and it seems necessary to call attention to it anew.

LABOR SUPPLY.

The number of men employed as laborers in the Territory during the last year was considerably in excess of the number employed in any previous year, but I am unable to furnish any reliable statistics. Business enterprises have multiplied, especially in the fisheries. Probably there is very little difference in the amount of labor performed in the mines. Laborers have been obtained from three classes, to wit: The natives have been largely employed in fishing, working the mines, packing for all purposes, as general assistants in excursions by land and water, and to some limited extent as carpenters and skilled workmen; some five hundred or more Chinamen have been employed about the salmon canneries, manufacturing and packing the cans, as cooks and waiters, etc., and a less number of Americans have been employed as foremen and skilled laborers. There have been no disagreements amounting to antagonisms between employers and employed. Some canneries have hired the Indians by the day, and others have purchased their fish at a stated price for each.

As the natives become acquainted with the English language and learn the civilized methods of doing their work they are thought to be desirable help. Two young men, graduates of the Sitka Industrial School, have been employed with much satisfaction as carpenters upon the Government and other buildings during the present season.

Some of the female graduates are employed as household servants and cooks.

VISITORS AND EXPLORING EXPEDITIONS.

A large number of summer vacation travelers have visited South-eastern Alaska during the present season, probably not less than 2,500. These people have manifested much interest in the country, and it is thought the knowledge they acquire as to the condition, resources, and needs of the country may prove of service to this Territory. Several scientific and exploring expeditions have also been made into the unknown portions of the district. Mr. Seaton Karr, an English traveler, with a party of personal retainers, entered the wilderness from the Chilcat River, in April, returning the same way in June. Following soon after, the Frank Leslie Illustrated Paper Expedition, including several gentlemen of scientific and literary reputation, ascended the Chilcat River, passed over the divide, and, separating, two of the party passed down the Alsek River to its mouth in Dry Bay, not far from Yakutat. These gentlemen are now here awaiting transportation to the States. The remainder of the party went on to the upper waters of the Yukon, and have not since been heard from.

The Mount St. Elias exploring expedition, headed by Prof. Israel C. Russell and Mark B. Kerr, prominent scientists, were dropped at Yakutat by the U. S. S. *Pinta* in the latter part of June. They purposed proceeding across the mountain range and spending some months in taking scientific observations in the vicinity and upon Mount St. Elias. They expect to be taken up at Yakutat in October. It is hoped that much useful information will be obtained and published by these and other parties making tours of observation in the Territory.

PRESSING NEEDS.

In conclusion permit me to suggest a few of the more pressing needs of the Territory which ought to be met by departmental and legislative action.

Provision for acquiring titles to land is essential to progress and the development of the country.

A town-site law adapted to the peculiar conditions of Alaska ought to be made at once.

Citizenship and the qualification of voters ought to be defined before elections are authorized.

Municipal organization and authorization of taxation for local purposes are important.

An extension of mail facilities to meet the reasonable requirements of the Territory ought not longer to be delayed.

The establishment of Government hospitals and provision for supporting insane paupers are demanded by the claims of justice and humanity.

A steam-vessel should be furnished for the use of the civil officers for the purposes of transportation and the administration of the government.

The public buildings are sadly in need of repairs for their preservation and to render them suitable for occupancy and the various purposes to which they are devoted. A new court-house should be erected at Juneau.

Agricultural experiment stations ought to be established in at least three places in the Territory, viz. in southeastern Alaska, in the Aleutian Archipelago, and in the Yukon Valley.

The interior of the Territory ought to be carefully explored to determine its character, climate, and resources, and examined as to the value and feasibility of an international railway to Bering Sea.

The coast surveys along the shores of Alaska are progressing too slowly for the requirements of commerce. Ten shipwrecks in one year suggest the need of haste in preparing accurate charts for the use of mariners navigating these dangerous waters.

The development of business and the growth of communities all over this extended territory render it necessary that there should be additional facilities for conducting the public business and protecting the people. More deputy marshals and more commissioners should be provided.

It seems absurd that with timber one of the most prominent features of this country, it should be necessary to import lumber to build the houses needed to protect the people from the inclemency of the weather. Provision ought to be made for cutting timber upon the public lands.

The laws applicable to this Territory have become inadequate to the protection of the persons and property of the people. Unnecessary and unfortunate complications are frequently arising and becoming more numerous every day. Relief is only possible through legislation. Something must be done. Shall it be attempted by the enactment of a code or by the authorization of a commission with enlarged powers, or by giving a full Territorial government, or shall some other remedy be devised?

The presence in Washington every winter of unauthorized persons assuming to voice the sentiment of the people of this Territory as to their condition and needs, and by their mistakes, to use no stronger term, doing us infinite mischief, ought to suggest to our statesmen the reasonableness of the demand for some authorized and recognized representation. I do not assume to determine the form of representation which should be provided. As soon as the conditions are suitable, and citizenship and the qualifications of voters are defined, and election districts and the machinery necessary for fair and honest elections can be provided, duly elected representatives of the people should be admitted to the privileges and duties of Delegates in Congress. While preparing for the elections, the Territory ought still to be represented by some recognized and legal agent.

There ought to be provided for Alaska a board of public charities with an appropriation for the relief of suffering want and the maintenance of paupers. Our pauper class is not large considering the character of our population, but it can not be supposed that among 40,000 people there is no destitution, no combination of sickness and poverty, no insanity or idiocy, no blindness, no pauper burials. Our condition is not favorable for organizing private charities on a basis broad enough to meet this need. Our white population is transient and neither large nor wealthy. Our native peoples are all poor and unaccustomed to giving. And under favorable conditions this method of relief would not meet the demands of humanity. The humane instincts of the world have long since decided that the generous impulses of men busied with the active interests and pursuits of life are too fitful and uncertain for the relief of prolonged cases of suffering and want.

It has been held that the natives of Alaska are not Indians, and that appropriations for Indian police do not apply to this Territory except when especially mentioned. But the native policeman is an important agent in the enforcement of peace regulations in our native villages

and even more important as a factor in promoting the efficiency of our native schools. Provision ought to be made for at least fourteen native policemen to be selected and located in the joint discretion of the governor and the general agent of education. Twelve or fifteen dollars per month would answer all purposes of compensation.

I am, very respectfully, your obedient servant,

LYMAN E. KNAPP,
Governor of Alaska.

REPORT OF THE ACTING GOVERNOR OF ARIZONA.

EXECUTIVE DEPARTMENT OF ARIZONA.

Phoenix, September, 1890.

SIR: In compliance with your letter of instructions dated July 28, 1890, I have the honor to submit the following report of affairs, progress, and development of the Territory of Arizona for the year ending June 30, 1890:

POPULATION.

The Eleventh Census just being completed, I am unofficially informed, states the population of Arizona as 57,600, exclusive of Indians and military reservations, and with those who live on reservations (not Indians) the population of the Territory will probably exceed 60,000. As the census of 1880 gave Arizona a population of 40,440 the gain in ten years amounts to 19,560.

In 1882 a census was taken under Territorial authority which placed the population at 82,976. This was, no doubt, inaccurate, and very considerably in excess of the true figures. At that time, however, mining excitement was great in the Territory, which invited a large floating population. It is exceedingly difficult to state the gain per year with any degree of accuracy, as the variations have been considerable, although there has been comparatively little variation in the official vote during the last ten years. In 1882, when the Territorial census gave a population of 82,976, the official record shows the vote for Delegate to Congress to have been 11,262, while the vote of 1888, with a population, according to the present census of less than 60,000, reached 11,538, a larger number of voters with apparently over 20,000 fewer people. This would be an anomaly if the figures were correct. It is, therefore, difficult to actually comply with your instructions in regard to giving "comparative statements showing annual increase," etc. According to the figures, the average gain since the census of 1880 has been a trifle less than 2,000 per year. I believe, however, that the gain per year has been much greater during the last three years than ever before in the history of the Territory, notwithstanding the periodical mining excitements which have occurred in the past.

The Territorial resources are being more regularly developed, occupations are more fixed, conditions are more favorable, and the population is consequently more permanent, and increasing more rapidly than ever before. While mining has always been the foremost industry of the Territory, and is probably now in a more healthy condition than ever, and producing more wealth than either agriculture or grazing, yet a major part of the immigration must now be credited to agricultural interests. This is attributable to the astonishing productiveness of the

arable lands, and the great progress that has been made during the last few years in the construction of canals, reservoirs, etc., and the extended reclamation of what has been designated as arid lands. While nearly every industry which can be found in other parts of the country are represented here, agriculture, mining, and grazing lead in the distribution of immigration in the order named.

As to the character and nationality of immigration, Americans very largely predominate, and they have come from all parts of the Union; the Western and Southwestern States being the more numerously represented, as immigration, as a rule, is largely influenced by the geography of the country, and to a large extent follows parallel lines. As Utah forms our northern boundary, considerable immigration comes from that Territory to us, and is Mormon in character. The number of Mormons in this Territory is estimated at 12,000, which is one-fifth of our population under the census, and in view of the restrictive legislation in Idaho, and the probability of similar action in Utah, it is more than likely that the immigration of that class of people to Arizona will rapidly increase. Bounded by the Republic of Mexico on the south, we have quite a sprinkling of Mexicans among our people. The majority of them have become naturalized citizens, and are in sympathy with American laws and customs. There are few Chinese in the Territory as compared with our northern neighbors on the Pacific Coast, and as yet they cut no figure as a disturbing element, although they are very objectionable as a class, and their exclusion is as much desired in Arizona as elsewhere. Statements as to the number of Mexicans and Chinese in Arizona have not been furnished by the census authorities.

With the more healthy development of the Territory's resources, and as our institutions become more firmly established, the stability of our affairs more assured, and public enterprise more extended, the character and permanency of our population improves. Our people are educated and energetic, quick to improve opportunities, and eager to be accorded equal privileges with the people of the self-governed States, and they are fully qualified for independence in that respect.

TAXABLE PROPERTY.

Taxable property, by counties.

Names of counties.	Acres of land.	Value.	Value of improvements.	Value of city and town lots.	Value of improvements.
Apache	{ *67,318.00 1,935,952.89	{ \$128,948.21	{ \$740,770.34	\$23,086.00	\$54,220.00
Cochise	21,054.07	{ 24,330.00 70,221.00	{ 401,649.00	86,603.00	247,889.00
Gila	7,118.00	{ 300,410.00	{ 113,875.00	21,784.00	77,880.00
Graham	51,319.00	203,161.00	99,417.65	16,478.00	108,278.00
Maricopa	274,308.00	1,772,605.00	305,875.00	1,175,656.00	564,080.00
Mohave	457.00	25,510.00	77,110.00	9,191.00	25,655.00
Pima	176,097.48	354,118.52	166,567.00	258,785.00	690,472.00
Pinal	21,249.00	{ 11,750.00 159,633.00	{ 59,535.00	58,683.75	82,214.00
Yavapai	834,278.81	456,647.56	162,196.00	197,808.16	360,747.00
Yuma	103,010.00	141,190.00	0,055.00	15,822.00	30,635.00
Totals	3,493,062.25	3,938,561.29	2,139,049.99	1,863,893.91	2,232,068.00

* Grant lands.

† Includes mines valued at \$267,350, and quartz mills and mining machinery at \$55,150.

‡ Railroad lands of the Southern Pacific Company taken out of the pro rata assessment.

Taxable property, by counties—Continued.

Names of counties.	Horses.	Value.	Mules.	Value.	Cattle.	Value.	Goats.	Value.	Hogs.	Value.
Apache.....	4,353	\$162,999.00	6143	107,000.00	68,927	\$583,870.50	841	\$561.30	2	22.50
Cochise.....	2,922	71,991.75	29716	595.00	85,292	627,641.42			224	922.00
Gila.....	2,941	72,755.00	158	1,521.00	43,233	422,612.10	642	899.00	224	922.00
Graham.....	2,774	84,400.00	222	8,255.00	53,623	507,438.00	1,375	1,923.00	630	1,426.00
Maricopa.....	4,650	145,549.00	43	1,000.00	23,843	231,000.00	5	8.00	1,299	1,229.00
Mohave.....	1,205	37,950.80	42	1,300.00	51,629	221,612.00	1,200	1,200.00	79	309.00
Pima.....	5,590	111,412.20	318	8,150.00	113,671	825,280.50	50	44.00	215	822.00
Pinal.....	2,202	53,570.00	220	7,530.00	40,032	248,229.00	9	12.00	320	951.00
Yavapai.....	14,007	385,263.00	201	9,171.00	173,627	1,570,814.50	281	240.50	260	1,485.50
Yuma.....	264	6,935.00	107	8,740.00	3,845	37,030.00			20	225.25
Totals...	40,956	1,071,903.76	1,065	64,280.00	641,616	5,321,809.32	3,842	4,279.00	2,701	10,028.26

Names of counties.	Sheep.	Value.	Asses.	Value.	Miles of railway.	Value.	All other property.	Total value.
Apache.....	119,380	\$178,541.00	63	\$444.00	111.60	\$679,140.00	\$916,228.80	\$3,716,554.43
Cochise.....	2,312	3,468.00	0	0.00	171.35	1,445,612.00	222,243.05	3,661,724.40
Gila.....	1,503	2,294.00	252	1,882.00			193,881.00	1,188,472.10
Graham.....	3,093	5,944.50	265	2,050.00	41	140,002.94	305,953.50	1,482,109.00
Maricopa.....	3,710	5,305.00	28	1,200.00	94.57	614,850.00	779,844.00	3,183,234.30
Mohave.....	2,050	3,100.00	107	1,159.00	114.375	686,259.00	55,044.00	1,183,527.00
Pima.....	1,341	2,011.50	81	660.00	125.65	801,000.34	565,719.50	3,845,304.50
Pinal.....	2,650	3,975.00	94	781.50	73.79	370,950.00	580,840.28	1,003,491.30
Yavapai.....	154,324	231,908.00	429	3,339.50	255.512	1,459,422.00	680,254.91	5,319,436.03
Yuma.....	65	82.50	22	115.00	80	500,000.00	30,303.00	851,338.50
Totals...	291,238	430,810.50	1,287	12,184.00	1,093.94	6,615,467.34	4,329,218.12	28,090,234.73

It appears from the foregoing that the Territory has taxable property assessed as follows:

3,493,062.35 acres of taxable land.....	\$3,938,564.29
Improvements thereon.....	2,139,049.90
City and town lots.....	1,863,893.91
Improvements thereon.....	2,339,968.00
641,616 cattle.....	5,321,809.32
291,238 sheep.....	430,849.50
40,956 horses.....	1,071,903.76
1,635 mules.....	64,280.00
1,287 asses.....	12,184.00
3,842 goats.....	4,279.00
3,701 hogs.....	10,028.26
1,093.94 miles of railroad.....	6,615,467.34
All other property.....	4,339,218.12
Total.....	28,090,234.73

It will be seen that the valuation is—

Land, per acre.....	\$1.13
Cattle, per head.....	8.30
Horses, per head.....	26.17
Sheep, per head.....	1.50
Railroads, per mile.....	6,047.38

The valuation of improvements and other property is comparatively much lower. The rate of taxation varies in the different counties, but the average rate throughout the Territory is 2.93 cents on the \$100. I have deemed it proper to be as specific as possible on this question of taxable property, as in my judgment it is very important in its bearings upon the welfare of the Territory. I believe the system which is being practiced in Arizona, viz, assessing property at a low valuation and

consequently necessitating a high rate, is exceedingly harmful and unwise. People seeking homes and places for the investment of capital, when told the rate of taxation, are frightened, and naturally so when an explanation is not afforded them. A bad impression is created and the idea is likely to prevail that taxes are extremely burdensome, and that a condition approaching bankruptcy exists, when the contrary is the truth. Nearly allox of the property in the Territory would bear a valuation double, and in many instances treble, the figures now stated. An increased valuation would, of course, reduce the rate; the same amount of taxes would be paid, but according to a different system; and the Territorial condition would be better understood by the people generally throughout the country. It is conceded by all who are acquainted with the facts that if all the property of Arizona were assessed, and at its full value, the rate of taxation would be as low here as in many of the most prosperous parts of the East. It is extremely desirable that the facts become known and understood so that people in different parts of the country and the legislative branch of the Government may not be misled as to our condition.

FINANCIAL CONDITION OF THE TERRITORY.

The following statement from the books of the Territorial treasurer gives the bonded and floating indebtedness of the Territory, life of the bonds, and amount of annual interest and rate of interest on bonds and warrants:

Territorial bonded and floating indebtedness.

Names of bonds.	Date issued.	Amount.	Rate of interest.	Annual interest.	Mature when.
			<i>Per cent.</i>		
Territorial prison bonds	Mar. 1, 1879	\$15,000	10	\$1,500	15 years, first issue.
Do.	Mar. 1, 1880	15,000	10	1,500	15 years, second issue.
Gillette Tiger Mine wagon road ..	Apr. 1, 1879	20,000	10	2,000	15 years.
Florence, Globe City wagon road ..	do	10,000	10	1,000	Do.
Tucson, Globe City wagon road.	do	10,000	10	1,000	Do.
Agua Fria, Camp Verde wagon road.	Aug. 1, 1879	10,000	10	1,000	Do.
Yuma, Ehrenberg wagon road	May 1, 1881	10,000	10	1,000	Do.
Territorial redemption	June 1, 1883	241,000	7	16,870	\$200,000 issued* 20 years; \$19,000 paid 3-6-'90.
Insane Asylum	Mar. 9, 1885	100,000	7	7,000	20 years; part in 10 years if surplus in fund.
Wagon road bridge	Nov. 1, 1885	12,000	8	960	15 years.
Gila bridge	May 15, 1885	15,000	8	1,200	Do.
Arizona University	Jan. 1, 1887	25,000	7	1,750	20 years; part in 10 years if surplus in fund.
Territorial funding	Jan. 15, 1888	150,000	6	9,000	25 years.
Total		633,000		45,780	

*Provision for proportional redemption after five years.

General fund warrants outstanding September 2, 1890, \$124,158.95; 10 per cent.
Total bonded and floating indebtedness September 2, 1890, \$757,158.95.

The total bonded indebtedness, \$633,000, upon which an annual interest is paid of \$45,780, makes the average rate of interest about 7 $\frac{1}{2}$ per cent.; but with the floating debt of \$124,158.95, bearing 10 per cent., added to the total indebtedness of the Territory at this date, amounts to \$757,158.95, the rate of interest on which would be, if the debt were fixed, over 8 per cent. The floating debt, however, will be very largely reduced by the redemption of warrants after the annual

taxes are paid, and \$90,000 approximates very nearly the regular floating debt of the Territory under present conditions.

The indebtedness, floating and bonded, of the various counties, is stated as follows:

Counties.	Bonded.	Floating.
Apache.....	\$100,000.00	\$24,000.00
Cochise.....	105,000.00	25,500.00
Graham.....		111,000.00
Gila.....	17,500.00	21,000.00
Maricopa.....	45,000.00	60,000.00
Maricopa.....	272,000.00	37,000.00
Pima.....	250,000.00	30,000.00
Pinal.....	410,000.00	
Yavapai.....		101,000.00
Yuma.....	*400,000.00	45,000.00
Yuma.....	115,700.00	42,000.00
Aggregate.....		2,221,010.00

* Estimated.

† Legality of \$150,000 Pima County bonds in question; issued to Arizona Narrow Gauge Railroad Company, as follows: July 1, 1883, \$50,000; June 30, 1884, \$50,000; August 3, 1881, \$50,000.

‡ All can be funded.

The above figures do not include interest, except as to the county of Graham.

The indebtedness of the incorporated cities of the Territory, bonded and floating, is as follows:

City.	County.	Bonded.	Floating.	Valuation.
Phoenix.....	Maricopa.....	\$40,000	\$12,000.00	\$1,517,420
Prescott.....	Yavapai.....	71,000	15,000.00	855,000
Tucson.....	Pima.....	25,000	7,000.00	1,000,000
Tombstone.....	Cochise.....	4,075	27,000.00	404,500
Total.....		200,075	59,000.00	4,075,970

To these figures the interest on county indebtedness for the present year should be added, also a school debt, which for the whole Territory is estimated at less than \$40,000.

By the foregoing statements the entire indebtedness of Arizona, Territorial, county, municipal, and school may be very closely approximated at \$3,481,688.78, as follows:

Territorial, bonded and floating.....	\$757,153.93
County, bonded and floating.....	2,221,010.00
Municipal, bonded and floating.....	205,616.30
Interest (average) on all kinds of indebtedness.....	257,908.57
School.....	40,000.00
Total.....	3,481,688.78

This amount of indebtedness, with the low property valuation of \$28,000,000, is very likely to mislead when not explained. The fact is that the actual property valuation of the Territory amounts to and should be stated at fully \$70,000,000.

In this connection I will state that a law has been passed by the present Congress, approved June 25, 1890, entitled "An act approving, with amendments, the funding act of Arizona," the provisions of which, if properly observed and acted upon, will, in my judgment, put the financial affairs of Arizona upon an exceptionally sound basis. The act pro-

vides, under legal limitations and restrictions, for funding all the floating indebtedness—Territorial, county, municipal, and school, and such of the bonded indebtedness as can be lawfully redeemed—at a rate of interest not to exceed 5 per cent. per annum, the bonds to run fifty years, although they may be redeemable after twenty years; the Territory, under the act, assuming the obligations of counties and municipalities, and all securities that can be funded made Territorial, the Territory being protected by equalized taxation. It is believed that all proper safeguards are embraced in the law for the protection of public and private interests, and that its operation can not fail to be of very great benefit to the Territory. The principal advantages are the reduction of interest and the placing of the affairs of government—county, Territorial, and municipal—for the future upon a cash basis.

The law provides, not only for the funding of outstanding indebtedness, but also authorizes the placing of sufficient bonds to provide for all the legitimate expenses of government now due or to become due up to January 1, 1891. After that date all expenses to be met by a tax levy sufficient to prevent indebtedness. The Territory is under obligations for this important legislation to Governor Lewis Wolfey, who was its originator, and who, by persistent effort, obtained its enactment. As the Territory has never repudiated its obligations nor defaulted interest, its bonds being all held at a premium, it is very probable that the new issue will be in great demand. As the interest on the floating debt (outstanding warrants) is in nearly every instance 10 per cent., the saving on the floating debt, when the same is funded, will be 5 per cent., but as the average rate of interest paid by the Territory on all of its indebtedness, Territorial, county, and otherwise, is 8 per cent., the computation as to saving is made on that basis.

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RAILROADS.—COMMERCE AND PROGRESS.

The following railroads are now being operated in the Territory:

	Miles.
Southern Pacific of Arizona.....	383+
Atlantic and Pacific.....	393+
New Mexico and Arizona.....	87+
Prescott and Arizona Central.....	73+
Arizona and New Mexico.....	41+
Arizona and Southeastern.....	36+
Central Arizona.....	35
Maricopa and Phoenix.....	34+
Tucson, Globe and Northern.....	10
Total.....	1,093+

The Southern Pacific passes across the southern part of the Territory from Yuma on the Colorado River to the eastern boundary of Cochise County, passing through the counties of Yuma, Maricopa, Pinal, Pima, and Cochise.

The Atlantic and Pacific crosses north of the center of the Territory near the thirty-fifth parallel and passes through the counties of Apache, Yavapai, and Mohave.

The New Mexico and Arizona runs from Benson, on the Southern Pacific, in Cochise County, to Nogales, in the same county at the Mexican line.

The Prescott and Arizona Central runs from Prescott Junction on the Atlantic and Pacific to Prescott and is all in Yavapai County.

The Arizona and New Mexico runs from Clifton, in Graham County, to the Southern Pacific at Lordsburg, N. Mex.

The Arizona and Southeastern runs from Bisbee, Cochise County, to Fairbanks, on the New Mexico and Arizona, in the same county.

The Maricopa and Phoenix runs from Maricopa, Pinal County, on the Southern Pacific, to Phoenix, Maricopa County.

The Central Arizona runs from Flagstaff, on the Atlantic and Pacific, southward for 35 miles in the pine forest, and is projected to extend to Globe, in Gila County, and possibly to Phoenix, Florence, Tucson, and Calabasas, in southern Arizona. This road was formerly known as the mineral belt and is not now being operated except for logging purposes by the Arizona Lumber Company. The extension of the road as projected would be of the utmost advantage to the Territory. Railway communication from north to south is absolutely necessary to the proper welfare and progress of Arizona. Two north and south roads are being projected and the people of the Territory are very desirous for their success.

The Tucson, Globe, and Northern is a narrow-gauge road, and has 10 miles of track laid northward from Tucson, but is not being operated and is not in repair. This road, as originally projected, was intended to run from Tucson, in Pima County, to Globe, in Gila County, and thence northward. The county of Pima issued bonds in the sum of \$150,000 to aid the enterprise, the legality of which is now being questioned. The commerce of the roads being operated in the Territory can not be satisfactorily reported, as very incomplete data has been furnished by the different roads as to the quantity of export and import traffic.

The subject of north and south railroads is of paramount interest to the people of Arizona, and one upon which their prosperity to a very great degree absolutely rests. It is true that we now have two great trunk lines running east and west, one across the northern and the other across the southern part of the Territory, but the chief desire of the people is that they be brought into competition by roads constructed from north to south.

The physical formation of the country is such that with the present transportation facilities an interchange of home products is barred.

The Atlantic and Pacific traverses an upland plain (Colorado plateau) at an average elevation through Arizona of over 5,000 feet, and the Southern Pacific crosses the low valleys and agricultural sections of the Southwest.

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AGRICULTURE AND IRRIGATION.

The arable lands of Arizona are more bountifully productive, and the soil is deeper and richer, than any subdivision of the Union of equal size, and in all branches of agriculture and horticulture the Territory is making rapid strides into conspicuous prominence.

The following tables, compiled from authentic sources, will give a fair idea of the progress being made in this direction; many important localities, however, are not included in the tabulated statements, on account of official data not being furnished and only such portions of the Territory as are giving irrigation and agriculture particular attention are presented.

MARICOPA COUNTY.

Maricopa County is the leading agricultural district of Arizona, and the canals and agricultural productions of the county are stated as follows:

Canals.	Length.	Reclaimed land.
	<i>Miles.</i>	<i>Acres.</i>
Arizona.....	41	50,000
Grand.....	27	45,000
Maricopa.....	26	
Salt River Valley.....	20	
Tempe.....	19	25,000
Highland.....	22	18,000
Mesa.....	9	13,000
Utah.....	6	10,000
Farmers'.....	5	21,000
	181	182,000

The foregoing canals are in the Salt River Valley, while on the Gila are the following:

Canals.	Length.	Reclaimed land.
	<i>Miles.</i>	<i>Acres.</i>
Buckeye.....	30	20,000
Palmer.....	23	12,000
Enterprise.....	12	8,000
Citrus.....	14	5,000
Gila River.....	8	5,000
	86	48,000

The average in crop this year under the Arizona, Grand, Maricopa, and Salt River Valley is 50,000 acres, consisting of:

	<i>Acres.</i>
Alfalfa (about).....	11,500
Orchards and vineyards.....	3,000
Grain.....	35,000

There has been raised under these four canals this year fully 35,000,000 pounds of grain, and 184,000,000 pounds of alfalfa. Of the 3,000 acres in fruit, 200 acres are in oranges. There are 25,000 acres in crop under the Arizona alone, leaving about 25,000 acres under the other three.

There has been a great deal of land under the Tempe Canal cultivated in wheat and barley together. The yield from this the present year under the Tempe Canal was 2,420,000 pounds. The yield of barley was 2,835,000 pounds. The acreage in alfalfa was 7,395. There were 20 tons of peaches raised at Tempe, or rather under the canal, and 10 tons of apricots. The grain, according to the best authorities, averaged about 1,000 pounds to the acre.

The Mesa Canal has under it 8,000 acres in cultivation, of which 3,000 acres are in alfalfa, 2,000 acres in vines, 500 acres in trees, and the remainder, viz., 2,500 acres, are in grain. The grapes average 2½ tons to the acre, and the grain has gone as high as 18 sacks to the acre.

Under the Highland Canal there are 7,680 acres in cultivation. 2,240 acres of this are in alfalfa, 20 acres in fruit, and 5,420 in grain.

The Indians of the county have a good showing for the year. The following is an accurate statement of their productions:

Acres cultivated.....	4,000	Barley produced:	
Wheat produced:		1890..... pounds..	85,000
1889..... pounds..	6,000,000	On Papago Reservation:	
1890..... pounds..	4,000,000	Wire fence made..... rods..	7,500
Corn produced:		Hay made..... tons..	150
1889..... pounds..	13,000	Wood sold..... cords..	1,200
1890..... pounds..		On Pima and Maricopa Reservations:	
Barley produced:		Horses.....	4,000
1889..... pounds..	80,000	Cattle.....	3,500

RECOMMENDATIONS.

Legislation by Congress and action of the Interior Department is recommended upon the following subjects:

(1) That an enabling act for the admission of Arizona as a State be passed by Congress at the earliest possible moment.

(2) That all the public lands within Arizona be donated to the Territory, title to pass upon admission as a State.

(3) That all school lands within Arizona be donated to the Territory for school purposes, and provision be made for the selection of good sections in lieu of bad.

(4) That the Apache Indians, who are now under military surveillance, on San Carlos Reservation, be removed from the Territory, and the reservation opened for settlement.

(5) It is further recommended that all Apache Indians on reservations under military guard be disarmed, and that they be prohibited from the possession of rifled guns and fixed ammunition, and that it be made a felony for any person to sell or furnish the Indians such guns and ammunition under similar penalties as are imposed for the sale of liquor to Indians.

(6) It is earnestly urged that if the Indians are not removed that the limits of their reservation be reduced, and the mineral and coal lands on the reservation be segregated and made available.

(7) It is requested that Congress appropriate for the erection of buildings for the use of the public service in Arizona.

(8) It is recommended that the provisions of what is known as the "Idaho test oath" be made applicable in Arizona.

(9) That the act now before Congress which provides for a fourth judge in Arizona be passed.

(10) That the salaries of the present judges in Arizona be increased to \$5,000 per annum.

(11) That the pay of legislators in Arizona be increased to \$10 per day.

(12) That appropriations be had by Congress to pay the governors and secretaries of Territories the amounts allowed them by law under section 1845, Revised Statutes of the United States, 1878.

(13) That Congress appropriate a reasonable sum for artesian well-boring in this Territory.

(14) That all public lands within the Territory be surveyed.

* Not estimated yet

UNDEVELOPED RESOURCES.

The possibilities of Arizona's full development cannot be anticipated and the probabilities are also beyond any possible conservative estimate. Opportunities for profitable mining, grazing, and agriculture are practically limitless. The scope of our industries can not be measured. There are millions in precious metals in the rock-ribbed crevices of the mountains; millions in the nutritious grasses of the mesas and plains; millions in the extensive and marvelously productive agricultural valleys, and millions in the broad forests of timber in Arizona. Well directed labor and energy are at all times productive of independence and comfort here. The Territory is an empire within herself, with agricultural land enough for the home consumption of a population as large as that of any State in the Union; with a grazing territory unsurpassed anywhere; with forests of timber sufficient for the building purposes of a populous State for many years; with untold millions of mineral wealth in her mountains for export. Arizona, when appropriate legislation is had, and proper facilities afforded for the development of her great resources, will take a place of deserved prominence in the Union of States.

Respectfully submitted.

N. O. MURPHY,
Acting Governor.

Hon. JOHN W. NOBLE,
Secretary of the Interior.

REPORT OF THE GOVERNOR OF IDAHO.

EXECUTIVE DEPARTMENT,
Boisé City, Idaho, October 20, 1890.

SIR: In compliance with your letter of July 28, requesting a report of the affairs, progress, and development of Idaho for the year ending June 30, 1890, I have the honor to submit for your information such incidents and data as I have been able to obtain and in my opinion may be of value. On account of the date fixed by the statutes for county and Territorial officers to make their returns, the data given will cover nearly a year.

POPULATION.

In my report for 1889 I estimated the population of the Territory to be 113,777. This estimate was reached through county assessors and from correspondence with intelligent and well-informed citizens in the several counties. In my last report I stated that—

The population of a district so large as Idaho is difficult to determine, and can not be ascertained accurately until the census is taken. By those who have a knowledge of the topography and industries of the Territory this is readily understood.

Mining being one of our principal industries, we find men in small parties engaged in working placer mines in distant and secluded sections, several miles distant from other mining camps. Again, we find men on the mountain slopes, and in some instances near the summit of our most lofty mountains, engaged in opening and developing quartz mines, which carry gold, silver and other valuable metals. A considerable number of men are constantly employed in prospecting for mines. Small settlements are found in nearly all the mountain valleys. Settlements on the plains and in the lower valleys cover so large an area of country that it is difficult to obtain a correct estimate of population among them.

I had hoped that through the census enumerators we would be able to reach all isolated camps and settlements. In this I am disappointed. I have information that leads to the belief that thousands of our people were not enumerated. Advice from authentic sources is conclusive that many of our mines were not visited by the enumerators.

Several large districts occupied by men engaged in prospecting for and in developing mines were overlooked or neglected. If the governors of States and Territories were confided in and permitted to consult freely with enumerators, the census taking would be much more accurate and satisfactory. I am confident that the population of Idaho, if correctly enumerated, would be as large as estimated in my previous report. As an evidence of omissions, Boise City is reported to have a population of 2,982. The Boise City Board of Trade, knowing this to be erroneous, have, since the enumeration was made public, taken the census of the city and report 3,922 population. It is more than probable that persons were enumerated by the board of trade who were not in the city on June 1, but there could not have been any such difference as shown by the above figures. I have similar complaints from all parts of the State.

In reply to a letter of inquiry, I received the following from Hon. A. J. Pinkham, supervisor of census for the District of Idaho:

OFFICE OF SUPERVISOR OF CENSUS FOR THE DISTRICT OF IDAHO,

Ketchum, Idaho, August 30, 1890.

GOVERNOR: I have the honor to acknowledge receipt of your letter of the 9th inst., in which you request me to furnish you with "the population of the State, and its distribution by nationalities."

In reply to your first inquiry I have to say that from such data as I have retained in my office from an enumeration of division enumerators' returns, I compile the population of the State by counties, as follows:

Ada.....	9,284	Kootenai.....	4,063
Alturas.....	2,626	Latah.....	2,422
Bear Lake.....	6,061	Lemhi.....	1,916
Bingham.....	13,492	Logan.....	5,151
Boisé.....	3,271	Nez Percé.....	2,534
Cassia.....	3,135	Oneida.....	6,827
Custer.....	2,169	Owyhee.....	2,071
Elmore.....	1,876	Shoshone.....	5,257
Idaho.....	2,965	Washington.....	3,828
			84,993
Boisé Barracks.....			76
Fort Sherman.....			397
Insane asylum.....			78
			85,649
Indians, estimated.....			3,000
Estimated loss on enumeration, 7 per cent.....			6,366
			96,915

" " " I am unable to furnish you with any information as to the nativity of our inhabitants, as all returns were forwarded to the Census Bureau at Washington, D. C., as soon as received and examined as to form in this office.

I am, very respectfully,

A. J. PINKHAM,
Supervisor.

HON. GEORGE L. SHoup,
Governor of Idaho, Boise City, Idaho.

REPORT OF THE SECRETARY OF THE INTERIOR.

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Annual assessment of real and personal property for the year 1890.

Counties.	Valuation.	Counties.	Valuation.
Ada.....	\$3,656,999	Latah.....	\$2,771,143
Altura.....	645,862	Lemhi.....	671,000
Bear Lake.....	913,915	Logan.....	1,700,928
Bingham.....	2,177,658	Nez Percés.....	1,079,850
Boise.....	684,381	Oneida.....	1,066,990
Cassia.....	672,613	Owyhee.....	824,116
Custer.....	723,670	Shoshone.....	2,096,161
Elmore.....	1,179,906	Washington.....	1,124,406
Idaho.....	1,000,808	Total.....	25,581,305
Kootenai.....	1,480,959		

Condensed classification of property assessed, 1890.

Property.	Valuation.
Real estate and improvements.....	\$11,173,511
Railroad property.....	5,358,338
Live stock.....	4,744,276
Goods, wares, and merchandises.....	1,612,615
Money, bank shares, and other securities.....	763,284
Personal property not classified.....	1,929,281
Total.....	25,581,305

From the above table it will be seen that the taxable property as it appears on the assessment rolls for the fiscal year amounts to \$25,581,305. The subsequent assessment rolls should add at least enough to bring the assessment up to \$26,000,000. The greater part of the real estate property is assessed in the months of April and May. Since that time there has been a large advance in real estate. The property of Boise City has advanced fully 60 per cent., and there is a rapid increase in new buildings. The same may be said of all the leading towns in the State. Improved farms have also advanced very much in value since the admission of Idaho as a State.

Next year the assessment value of property will exceed this year by several millions of dollars. Lands not patented are not taxed. There are many farms under the highest state of cultivation and improvement on unsurveyed lands, on which no taxes are paid, and will not be until the land is surveyed and patents obtained. Our mines are not taxed. They represent a valuation of \$50,000,000. With this large amount of unassessable property, taken together with the fact that property is not assessed at over 50 per cent. of its actual valuation, it will readily be seen that not more than one-fourth of the value of the property in Idaho appears on the assessment rolls.

PUBLIC LANDS.

The total area of Idaho is 86,294 square miles or 55,228,160 acres; classified as follows:

Class.	Acres.
Agricultural lands.....	16,000,000
Forest lands.....	10,000,000
Grazing lands.....	20,000,000
Broken, lava and mountainous lands.....	8,000,000
Lakes and rivers.....	1,228,160
Total.....	55,228,160

Between 8,000,000 and 9,000,000 acres of these lands have been blocked out by the surveyor into townships, many of which are not subdivided and many others are not complete. Large appropriations should be made for the survey of public lands. In many localities families have reclaimed lands and have occupied them for half a natural lifetime, have erected comfortable buildings, inclosed their farms and have invested large sums of money in irrigating canals, and are anxious to perfect their titles. This condition of affairs has prevented a better class of improvements than we find on surveyed lands, because they have but little idea where the section lines or the subdivisions will be when the land is finally surveyed.

These people are loyal to the Government and State. Many of them were pioneers, enduring great privations and hardships. Many of them defended their homes against the attack of hostile Indians, who opposed the settlement of the valleys by civilized people, and many of them can point to the graves of relatives or friends who fell by savage force while defending family and home. These people would gladly pay for the lands they occupy. They are only squatters, notwithstanding their long occupancy. It is true they pay no taxes on land, but they would gladly do so could they procure titles thereto, thereby adding largely to the tax list and assessment roll of the State, and the taxes would then fall more evenly upon all classes. I know it is improper to apply rules of survey to Idaho, enacted for the prairie States. Many townships in Idaho have been surveyed and subdivided where not one-tenth of the land can be reclaimed for agricultural purposes. This will, in part, account for the fact that out of over 8,000,000 acres surveyed, not over 1,000,000 is under cultivation. In my last report I called attention to the fact that—

It is absurd to apply rules of survey to Idaho which were constructed for Iowa and Kansas. The Department should provide pay and appliances demanded by a mountainous country. The survey should not only be a surface measurement of land, but it should also be a mineral and a geological survey; it should be an assistant in our irrigation system and a chart for forests and streams.

I again recommend that a generous appropriation be made for the survey of the public lands in Idaho. Justice to those who now occupy a portion of these lands, and justice to those who are seeking homes, demands it. I offer these suggestions on the presumption that the Government will continue to control the public lands.

I recommend, however, that all agricultural lands requiring irrigation be conveyed by the general Government to the States. There are large tracts of superior agricultural lands on high plateaus, and so far distant from water-courses that it will cost millions of dollars to convey water to them. If the State owned or controlled these lands a system would be perfected whereby the State could contract for the construction of large canals and would in time be re-imbursed for the sale of the lands thus reclaimed.

The protection and sale of timber on the forest lands should also, in my opinion, be under the control of the State Government. The legislature would enact laws for the protection of our grand and extensive timber belts. Foresters would be appointed who would see that timber lands on the border of the State were not the foraging ground of speculators, and would prevent our fine forests from the ravages of fire. The timber should be husbanded and disposed of under wise legislation, but the title of the land should not be conveyed. A new growth of timber will follow the old majestic forests, and the forests can be perpetuated for all time.

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AGRICULTURE.

In another article I have placed the agricultural lands of Idaho at 16,000,000 acres. From personal observation in every county in the State, I am convinced that this estimate can not be much under or over the actual number of acres. Vast districts have not yet been surveyed and until the whole area has been explored and classified by the surveyor the exact amount of agricultural lands will not be known. About three-fifths of the agricultural lands in the State are arid. To be productive and return a profit to the owner they must be irrigated. Thirteen out of the eighteen counties in the State are in the arid belt and require irrigation, "except eastern Camas Prairie, Long Valley, and a few other valleys of less area in high altitudes where the fall of rain is more abundant than on the lower plains," viz, Ada, Alturas, Bear Lake, Bingham, Bois , Cassia, Custer, Elmore, Lemhi, Logan, Oneida, Owyhee, and Washington. The soil in these counties is composed largely of vegetable mold, mixed with a sufficient quantity of mineral, clay, and sand, according to the locality, to give warmth and fertility. Usually there is a considerable growth of sage brush on these lands; it is removed, however, with small expense. These lands can be relied upon, when irrigated, for large and uniform harvests of cereals and vegetables of all kinds. The altitude governs to some extent the character of the products. Grain and hardy vegetables grow abundantly in all altitudes not greater than 6,000 feet.

The most extensive agricultural valley in Idaho, in fact in the great arid belt, is the valley of the Snake River. This great valley contains several million acres, commencing on the line of Wyoming, extending through several counties to Oregon and Washington. Bingham, the upper and eastern county in this valley, is the largest agricultural county in the State. There is a large increase of acreage in cultivation in this, and, in fact, in all the counties in the State this year. In many of the counties above mentioned there are large valleys, well watered, and very productive. From reports and from personal observation I am convinced that the agricultural products of Idaho are fully 40 per cent. greater than last year. The harvests have been most abundant in grain, hay and vegetables of all kinds.

The counties of Shoshone, Kootenai, Latah, Idaho, and Nez Perc , differ from the other counties in several respects. There the soil is deep and of the blackest and richest loam, with occasional mixture of sand, clay, and mineral wash; and, like in Washington and Oregon, the rain-fall is sufficiently abundant to make irrigation unnecessary. I have just returned from a visit to these counties and must say that I was amazed at the great yield of wheat and other cereals. Wheat, just threshed and weighed, produced from 35 to 60 bushels of excellent quality to the acre, with many fields exceeding this amount. The quantity of hay harvested in this State is more than 100 per cent. greater than last year. Fruits of all kinds and varieties, except peaches, are now raised in all the valleys of Idaho not exceeding 4,500 feet above sea-level. Peaches generally do well in the lower valleys. In several localities fruit has not been as abundant as last year, much of it falling from the trees before maturing on account of the ravages of the insects.

The year just drawing to a close has been one of remarkable prosperity for Ada County. More than 10,000 acres have been added to its area of cultivated lands; the amount of capital invested in agriculture

has increased 26 per cent.; to the extent of its irrigating canals there has been added 30 per cent. Turning from agriculture to trade, we find the increase in ordinary traffic has been 25 per cent.; the increase in new buildings over the growth of last year has been 50 per cent.; and the increase in railway traffic has been 100 per cent.

From three railway stations the export of wool has been 793,907 pounds. The number of sheep kept in Ada County was increased 15 per cent. during the past year.

Looking forward the outlook is brighter still. Two million dollars will, during the coming year, be invested in irrigating canals, enabling farming operations to increase 20 per cent. Building is likely to be limited simply to the supply of material. Government lands are entered as fast as irrigating canals are surveyed by responsible companies, settlers valuing the lands so highly that they are willing to wait any reasonable time for the actual construction of canals. One year ago lands on the plains, contiguous to water supply, with very limited improvements, for which Government title had been secured, were quoted generally at \$10 per acre. Now these lands rarely sell below \$20 per acre. These prices are justified by the prices which their products bring. The following were the lowest wholesale quotations of Ada County products on October 3, 1890:

Wheat flour.....	per 100 pounds..	\$2.25
Corn meal.....	do.....	2.25
Wheat.....	do.....	1.16 1/2
Oats.....	do.....	1.50
Corn.....	do.....	1.50
Barley.....	do.....	1.75
Rye.....	do.....	1.40
Hay—		
Timothy, loose.....	per ton..	9.00
Timothy, baled.....	do.....	12.00
Lucerne, loose.....	do.....	8.00
Lucerne, baled.....	do.....	11.00
Clover, loose.....	do.....	8.00
Clover, baled.....	do.....	11.00
Potatoes, Irish.....	per 100 pounds..	1.50
Butter—		
Dairy.....	per pound..	.35
Ranch.....	do.....	.30
Eggs.....	per dozen..	.35

STOCK-RAISING.

One of the principal industries and sources of revenue to the people of Idaho is stock-raising. For many years, when there were broad stretches of plain and plateau, with but an occasional habitation, this industry was very profitable to those engaged in it. The herdsman never thought of providing winter feed for horses or cattle. Generally a stock of all kinds wintered well, with losses scarcely worth noticing. The large herds were kept on the ranges in high altitudes during the summer, where the sweet bunch grass is most abundant. When autumn storms covered these high plateaus with snow the herds were driven to the lower valleys, generally designated as winter ranges, where grass and sweet and white sage were abundant. Owing to the purity and dryness of the climate the grass cures on the ground, retaining its substance. The white and sweet sage (why it is called sage no one knows, as it has not the slightest resemblance to it) grows from 6 to 15 inches in height, is prolific with seed, and very nutritious.

As the valleys and low lands became settled the winter ranges were inclosed as farms. Long strings of fences separated former ranges into many subdivisions and inclosed what was once the finest ranges within our borders. The frontage on streams being inaccessible, stockmen must necessarily find feed further back and on higher ground. It became necessary to reduce or divide large herds into smaller bands. Owners of large herds relied on the range feed for the greater part of their stock, while others were more prudent and cultivated large meadows. This was the condition of affairs with stock-growers up to last year.

The past winter was the most severe ever experienced since the settlement of the country. Those who had not provided winter feed, permitting their stock to run at will upon the plateaus and in the valleys, suffered heavy losses in all kinds of animals that were left to seek for subsistence upon the ranges. Those engaged in this business are now guarding against future heavy losses by providing winter feed.

There has been an abundance of feed on the ranges this year and stock of all kinds will go into the winter in excellent flesh. The reverse was the case last year, the season being the driest ever experienced in the Territory and stock of all kinds very thin at the opening of the severe winter. Should the coming winter be mild stock will come out in the spring in fine condition and a large amount of the winter feed in store will be carried over for a more rigorous season. With the precaution now taken the loss in stock hereafter will be small. I estimate that it will take all the natural increase of cattle and horses this year to cover the losses of last winter. The percentage of losses in sheep was less than of other stock, greater precaution having been taken for their protection.

Satisfactory prices have been obtained this season by stockmen for horses, beef cattle, and sheep. Stock of all kinds is being improved by importation of well-bred animals. Now that growers are prepared for severe winters there will be a rapid increase of stock. It is not probable that we will experience another winter like the past for many years to come, if ever.

MINING.

Since the discovery of gold in Idaho by Capt. James Pierce and party on Oro Fino Creek in 1860 the mines of Idaho have produced to date about \$175,000,000. For several years after the discovery made by Captain Pierce, mining was confined exclusively to surface or placer mines. As this class of mines gave evidence of exhaustion, some attention was given to prospecting for gold and silver quartz lodes, but the distance from railroads and navigable waters made freights so enormous and all kind of supplies so expensive that only very rich mines could be worked and pay a profit after defraying expenses. This condition of affairs continued until the reduction of the high rates of freight, influenced by the approach of railroads, gave a new impetus to prospecting. Many old prospectors who had abandoned Idaho for unexplored fields where freight and supplies were less expensive returned and resumed the search for mines in the great mineral belts of Idaho, extending from Montana and Wyoming on the east to Oregon and Washington on the west and to the British possessions on the north.

Gold and silver leads were discovered and located in great numbers, but as a rule the prospector has but limited means and not one in fifty in past years had the ability to open and operate a mine after its discovery. Gradually the mines fell into the possession of men who had

ability to properly develop them and put machinery in place for reducing the ores; but with the close of each year we find an increased number of quartz-mills, smelters, and concentrators owned and operated by men who reduce or purchase ores direct from the miners, paying the market price therefor, thereby enabling the miner to dispose of his ores, or at least a sufficient quantity to defray expenses while developing his mine.

There has been for several years a satisfactory increase in the production of our mines. The output last year was nearly double that of any former season. The bulk of the increase came from the Cœur d'Alene mines in Shoshone County, principally from the South Fork of the Cœur d'Alene River and its watershed. The ores of these mines are known and classified as lead-silver ores, the bulk of which is concentrated before shipping. These ores carry from 30 to 60 per cent. lead and 30 to 50 ounces in silver, with occasionally a mine above or below these figures. Developing work has been in process on some of these mines for several years, but not until the completion of railroads into that section, thereby reducing the rates of transportation, could these mines be worked profitably. There is in the Cœur d'Alene country a number of the largest lead-silver mines known, and with the recent advance in the value of silver and lead their value has proportionately increased.

Mammoth lead-silver mines have been developed on the tributaries of the North Fork of the Cœur d'Alene River, but will not be producers to any extent until the completion of a railroad near them, which is promised next year. There are several fine gold quartz lodes on Pritchard Creek, a tributary of the North Fork, of which the "Mother Lode" is the most productive. A mill and an arrastra are kept constantly at work on these ores. From this section over \$2,000,000 in placer gold has been taken out, and there yet remains millions in the creeks and bars. The richest and most extensive deposit of placer gold in this district is in an old river channel crossing the country several hundred feet above the present streams. Through this channel once flowed a river much larger than any now in that region. From whence it came, or whither it went, no one will ever know.

In Kootenai, the adjoining and most northerly county in the State, extensive gold, silver, and lead mines have been discovered. Several mills have been built, and the mines have just fairly commenced to produce and will make a good exhibit next year.

Idaho County is the largest and has a greater area of mountains than any other county in the State. These mountain sides may be said to be ribbed with gold quartz veins, and it is the most inaccessible region in the State. At the mining camp of Warrens a mill is working on gold quartz running from \$25 to \$80 per ton, and yet the profits are not large. It costs \$8 to \$12 for each 100 pounds to pack in supplies. The State has contracted for the construction of a wagon road from Mount Idaho to Little Salmon Meadows at an expense of \$50,000, which will penetrate this rich mining district. Much of this mountainous region has not been explored by prospectors on account of its isolation. Enough is known, however, to warrant the belief that it will some day be one of the most productive mining counties in the State.

Lemhi and Custer Counties abound in numerous gold and silver mines, and, with the exception of a few fertile valleys, are also very rugged. Several of the mills in these counties, from mishaps of vari-

ous kinds, have been closed down for some months past, thereby reducing their usual large production. The mines in these counties are inexhaustible.

Alturas and Logan Counties abound in lead silver mines, with many gold quartz veins.

The mountains of Elmore, Boise and Ada Counties have each hundreds of gold and silver mines. The two former counties have several mills in operation and will have several more next season, Boise County has also large placer fields.

Owyhee County is one of the oldest quartz mining districts in Idaho, but high freights and the expense of operating mines and mills has been so great that many of the mines were abandoned, or for many years only the assessment work done on them. Recently new life was infused into this district and systematic work resumed, developing some of the finest properties in the State. The Wilson group owned and operated by Captain De Lamar has developed several very large veins, the largest of which is 75 feet between walls, and every pound is worked through the mill. There is a 20-stamp mill on this property which has produced over \$800,000 in the past year, and nearly all of this large amount from development work alone. There are several million dollars worth of ore in sight. Several other mines near Silver City are paying well and have developed extensive bodies of ore.

Gold, silver, and lead mining is yet in its infancy in Idaho. In my opinion, before many years, this will be the most extensive, most productive, and best paying mining region in the world. There is yet in the State, in addition to the class of mines above referred to, thousands of acres of placer mines, prospected, but otherwise scarcely touched. These extensive fields are so high above or so distant from water, that they are beyond the reach of the individual miner, but in time capital will be employed to cover them with water. The sands of Snake River contain millions of dollars of fine scales of flour gold. As yet miners have been unable to save this gold by the present methods or machinery used in placer mining, or at most only a small percentage of it. This problem, without doubt, will ere long be solved.

In the Seven Devils mining district, located in Washington County, are some of the largest and most extensive veins of copper ore known to exist. At present these mines are too far distant from railway transportation to be worked with much profit. About \$50,000 worth of this ore was shipped this year. I have seen pieces of ore from one of these mines, the South Peacock, with free gold exposed to sight.

On Big Lost River, in Custer County, there is a very large vein of copper ore. This property was recently purchased by capitalists, who have now a large force of men at work extracting ore. In Lemhi County there are also several veins of high-grade copper ore.

COAL.

In some localities prospecting for coal is still being vigorously carried on with encouraging results.

In Owyhee County a fair quality of lignite has been taken out and the locators are greatly encouraged as work progresses in the way of development. As a matter of great interest, not only to the Government of the United States, but of greater moment to the people of our own State, I feel justified in inserting the statement of Mr. John McMahon, a resident of Owyhee County, in reply to a letter of inquiry on

the subject in his section of the State. Mr. McMahon is a reliable citizen of the State and a gentleman of experience and wide and varied information. He says:

At a point 15 miles east of the State line on Reynolds Creek, Owyhee County, we find a contact formation between granite and sandstone. There coal is found in small quantities. From this point it is traceable west across the State line into Malheur County, Oregon, for a distance in all of 22 miles. North and south the coal is traceable in Owyhee County for a distance of 16 miles, making a total of about 240 square miles. The largest deposits yet found are situated 5 miles east of the State line on McBride Creek. These discoveries and locations were made in April, 1889, and consist of eight veins underlying each other, all of which can be penetrated by a vertical shaft 80 feet deep. On this mine, called the Idaho Coal Mine, considerable work has been done in the last year with the most encouraging results. A drill hole 34 inches in diameter was sent down 60 feet southwest of croppings, cutting two veins of 3 feet and 3 feet thick, confirming the existence of continuous veins for 450 feet wide. A level or drift is now run along the vein for a distance of 150 feet, showing a well-defined vein, free from internal disturbance. Several small or short drifts and shafts have been driven in the veins, showing improvement in quantity and quality of coal. Coal is now selling on the dump of this mine at \$4 per ton, and the consumers are highly pleased with the service it renders.

Marvil Wilson, a miner, has been doing considerable work on some coal veins close to the State line, in Owyhee County, Idaho, that will yet prove to be a source of great wealth to the State. All these veins need is the judicious outlay of money to develop them in order to add one more link to the chain of Idaho's vast mineral deposits. When we take into consideration the vigor exercised in the development of the gold and silver mines of Owyhee County and the consumption of fuel to reduce ore, I will state without reservation that the coal belt of Owyhee County, Idaho, offers inducements to capital not equaled by any other mining industry in the State to-day.

I may also state that coal, or a superior quality of lignite, has been discovered in Bois  County, on Shafer Creek, near Horse Shoe Bend, about 35 miles northwest from Bois  City. Sufficient developments have been made, and the quantity of the coal already taken out warrants the owners in seeking a market for the product throughout the adjacent settlements. As tested in the blacksmith's forge, it is rated by those who have had an experience in coal mining to be a very superior article.

The sample brought to this city by John Ireton, esq., a gentleman of intelligence and veracity, clearly demonstrates the value of this coal for purposes of fuel, and suitable for all domestic and manufacturing necessities. When taken out of the mine it has a dark, glossy appearance, and leaves, after being burned, a light-brown ash. It is clean to handle, and if the vein deepens with the explorations we may safely calculate and place it as another source of much wealth to the State. Large samples from the Horse Shoe Bend mine have been shipped to the chemist of the Union Pacific Railroad for a proper analysis.

Several very promising veins have been discovered on Medicine Lodge Creek, in Lemhi County; other smaller veins have been discovered in several localities in the same county.

In Washington, Cassia, Latah, and Kootenai Counties coal has been discovered, but not sufficiently developed to establish its value. It is probable that discoveries have been made in other counties of which I have not been advised.

FORESTRY.

In my report of one year ago upon this subject I suggested what I thought might be the most important points for the care and legislation of Congress, with a view to the preservation of the forests of this State.

That none will dispute the paramount importance of extending the

power of the Government in the preservation of the forests from the destruction which annually occurs to the extent of millions of dollars of the valuable timber which bountiful Nature has given us may be accepted as an admitted fact; yet we have gone on from year to year under a Territorial government for more than a quarter of a century without being able within our own resources or by exercising the police power at our own expense to preserve valuable belts of timber from destruction by fire. Nothing short of the immediate exercise of the absolute jurisdiction of Congress or the exclusive power and jurisdiction can save us in the future from similar losses.

It would seem as though the Congress of the United States had overlooked a great, wise, and economical policy in failing to provide safeguards to protect the standing timber on the public domain, which it has taken centuries to mature.

In every civilized government on the face of the earth we find that much care, wisdom, and statesmanship have been expended in devising plans and methods and systems by which the forestry of those countries could be nurtured, preserved, and utilized to the benefit of such governments and the people.

We have almost every variety of the soft and valuable woods, such as white and yellow pine, red and yellow fir, spruce, tamarack, and cedar, which grow and mature to a marvelous size in height and diameter, and which must, if preserved, become of essential value to not only the people who settle in our valleys and plains to cultivate the soil, but that numerous class engaged in our most valuable industry at present, mining.

We have nearly or quite 10,000,000 acres of timber lands classed as forest lands, while in addition to this we have millions of acres of mountainous lands upon which stand small yet most valuable groves.

We have, therefore, every resource for great lumbering production, if the Government will but take into consideration the necessity of preserving these great forests from the destructive fires which occur annually. We think it can be done upon such economic principles as to call for very little expenditure from the Government. The great belts of timber in this State are all, or nearly all, upon the Government lands and public domain yet unsettled, and are distinctly known as the source and course of the great rivers that meander through our boundaries. We will venture to say that by a system of police regulations, with timber agents, who may be employed for a few months in the year, or from the time when the wet season ceases in the summer to the time of the commencement of the rainy season in autumn, a perfect guaranty could be assured against the destructive fires which occur every year, thus saving millions upon millions of feet of the finest timber that can anywhere be found to the utility of the Government and the people. The State might be divided into sections, providing for such police regulations under an appointed agent or agents or other person deemed best by the Government, and under whom can be employed suitable and faithful persons as mounted police to guard the trails and notify travelers and prospectors and others who build camp-fires upon their travels that such must be watched while they are burning and entirely extinguished when they leave to go on to another point. Take, therefore, the sections north, south, east, and west, I will venture to say that \$10,000 a year thus expended by the Government would preserve at least from a half to one million dollars' worth of timber from utter ruin every year.

The lands upon which most of this timber stands is not in a manner susceptible to settlement or cultivation, but remains as a distributive

source of wealth to the settler, the farmer, the miner, the lumbering man, and others who have need for its use in carrying on their respective industries.

From year to year these ideas have been urged modestly upon Congress and we trust that the subject will at the next session of Congress receive the care and the consideration its importance demands.

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IRRIGATION.

Last year Idaho was visited by the Senate Committee on Irrigation. The committee was composed of able and intelligent men, who devoted months of their time to the investigation and study of irrigation, visiting all the States and Territories embraced within the dry area. It was hoped that from their exhaustive examination of this question, so important to Idaho and the West generally, that the committee would be able to agree and report to Congress a bill fully covering the whole subject, but in this we were disappointed; the committee were unable to agree upon a measure covering the whole question and it went over. It is hoped that during the next session a bill will be agreed upon which will be of value to all the territory in the irrigable area. Congress should recognize that the ownership and distribution of water is something more than a local matter; it is interstate and international as well, and should have early and careful consideration. The longer legislation is delayed the greater will be the complications to overcome. It will be necessary for States to cross their line into neighboring States, to construct reservoirs for the storage of water for irrigation, domestic, and other purposes. Congress should anticipate, and enact laws covering cases of the kind, also in regard to streams flowing from one State into another, or through two or more States.

In Idaho the control and distribution of water becomes more serious each year. During the past year more capital has been invested in irrigating canals than in the ten preceding years; larger canals have been constructed in the Snake River, the Boise, Payette, and Weiser valleys, covering immense tracts of lands, a large part of which is unsurveyed and is being rapidly located or filed upon under the several land laws. Many land and irrigation companies have been organized during the past year, who are now constructing extensive canals.

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IDAHO ALTITUDES.

Elevations of prominent towns, lakes, villages, etc.

Name.	Elevation.	Name.	Elevation.
Albion.....	4,400	Craig Mountain.....	4,000
Altrona Lake.....	6,000	Custer Mountain.....	3,700
American Falls.....	4,320	Caribon Mountain.....	2,824
Atlanta.....	5,525	Centerville.....	4,830
Bear Lake.....	5,900	Challis.....	5,400
Bellevue.....	5,200	Clawson's Toll Gate.....	4,800
Blackfoot City.....	4,523	Custer City.....	6,500
Bloomington.....	5,985	Dry Creek Station.....	6,000
Boise City, Capital of Idaho.....	2,800	Eagle Rock.....	4,770
Big Camas Prairie, Altrona County.....	5,000	Estes Mountain.....	10,050
Big Camas Prairie, Idaho County.....	3,500	Fort Hall.....	4,780
Bonanza City.....	6,400	Fort Lapwai.....	2,000
Burke.....	3,900	Franklin City.....	4,516
Camas Station.....	4,700	Florida Mountain.....	7,770
Coeur d'Alene Mission.....	2,280	Florence.....	8,000

Elevations of prominent towns, lakes, villages, etc.—Continued.

Name.	Elevation.	Name.	Elevation.
Fish Haven	5,032	Paria Peak	9,522
Forks of Lolo	4,450	Placerville	5,100
Gentile Valley (head)	5,245	Putnam Mountain	8,933
Galena City	7,000	Quartzburg	5,115
Gladator Mine	9,700	Rathdrum	2,000
Henry Lake	6,443	Ross Fork Station	4,394
Hailey	5,350	Red Rock Ranch	4,792
Idaho City	4,263	Rock Creek	4,513
Junction Station	6,329	Rocky Bar	5,200
Jackson Lake	6,606	Red Fish Lake	6,600
Ketchum	5,700	Sawtooth's Peaks	9,070
Lewiston	680	St. Charles	5,932
Lake Pend d' Oreille	2,603	St. George	5,771
Lake Coeur d'Alene	2,150	Salmon City	4,030
Long Valley	3,709	Soda Springs	5,779
Murray	2,750	Silver City	6,680
Malad City	4,700	Sawtooth City	7,000
Market Lake	4,795	Shoshone	4,587
Montpelier	5,793	Summit, between Challis and Bonanza	9,109
Mouth of Port Neuf River	4,522	Summit, between Boise City and Idaho City	4,815
Mt. Idaho City	5,480	Summit, between Idaho City and Centerville	4,812
Montana Mine	5,603	South Mountain City	6,450
Mesa Mountain	10,540	Salmon Falls	3,225
Malad Divide	9,220	War Eagle Mountain	7,980
Onaida Salt Works	6,309	Weston	4,600
Onaida (town)	5,709	Weiser City	2,340
Oxford	4,852		
Paria	5,836		
Pocatello	4,512		

IDAHO NEWSPAPERS.

There are fifty newspapers published in Idaho, as follows:

Name of paper.	Place of publication.	Name of paper.	Place of Publication.
Statesman	Boisé City, Ada County.	Bulletin	Rocky Bar, Elmore County.
Sun	Do.	Free Press	Grangeville, Idaho County.
Hornet	Do.	Courier	Rathdrum, Cootenai County.
Democrat	Do.	Post	Post Falls, Kootenai County.
Times	Nampa, Ada County.	Panhandle	Do.
Progress	Do.	Evening Post	Do.
Tribune	Caldwell, Ada County.	Times	Coeur d'Alene City, Kootenai County.
Transcript	Payette, Ada County.	Mirror	Moscow, Latah County.
Times	Hailey, Alturas County.	Star of Idaho	Do.
News-Miner	Do.	Advocate	Kendrick, Latah County.
Keystone	Ketchum, Alturas County.	Advertiser	Geneseo, Latah County.
Observer	Montpelier, Bear Lake County.	Recorder	Salmon City, Lemhi County.
Independent	Paria, Bear Lake County.	Journal	Shoshone, Logan County.
Kaintuck Bugle	Rexburg, Bingham County.	Herald	Belleville, Logan County.
Rexburg Press	Do.	Teller	Lewiston, Nez Perce County.
Register	Eagle Rock, Bingham County.	Enterprise	Malad City, Oneida County.
Times	Do.	Avalanche	Silver City, Owyhee County.
News	Blackfoot, Bingham County.	Sun	Murray, Shoshone County.
Herald	Pocatello, Bingham County.	Miner	Wallace, Shoshone County.
Tribune	Do.	Press	Do.
World	Idaho City, Boise County.	News	Warner, Shoshone County.
Times	Albion, Cassia County.	Statesman	Oshosne, Shoshone County.
Silver Messenger	Clayton, Custer County.	Tribune	Mullan, Shoshone County.
Mail	Mountain Home, Elmore County.	Leader	Weiser, Washington County.
Democrat	Do.	Citizen	Salubria, Washington County.

MORMONS.

For many years the Mormon question has been an important factor in Idaho politics. When the first Mormon communities were established within our border, but little attention was given them; but as their settlements in the southeastern counties became more dense and

rapidly extended over several counties, under the direction and guidance of the leaders of the church, whose headquarters were in Salt Lake City, Utah, the influence of the Mormon Church in Idaho politics, at first merely noticeable, finally became pronounced. The revolting and pernicious practice of bigamy and polygamy was condemned by the better class of both of the great political parties in the Territory. That the church held and controlled the franchise of its members was apparent to all. Planks were inserted in political platforms denouncing the unholy teachings and practices of the church, and finally the legislature at its thirteenth session passed a registry law requiring all who wished to exercise the right of franchise to register, and at the time of registering each one exercising this privilege was required to take a rigid oath, which in substance reads as follows:

You do solemnly swear (or affirm) that you are a male citizen of the United States over the age of twenty-one years; that you have actually resided in this Territory for four months last past and in this county thirty days; that you are not a bigamist or polygamist; that you are not a member of any order, organization, or association which teaches, advises, counsels, or encourages its members, devotees, or any other person to commit the crime of bigamy or polygamy, or any other crime defined by law as a duty arising or resulting from membership in such order, organization, or association, or which practices bigamy or polygamy, or plural or celestial marriage as a doctrinal rite of such organization; that you do not, either publicly or privately, or in any manner whatever, teach, advise, or encourage any person to commit the crime of bigamy or polygamy, or any other crime defined by law, either as a religious duty or otherwise; that you regard the Constitution of the United States and the laws thereof and of this Territory, as interpreted by the courts as the supreme law of the land, the teachings of any order, organization, or association to the contrary notwithstanding, and that you have not previously voted at this election. So help you God.

The leaders of the church asserted that the above oath was unconstitutional, and carried it into our courts, where its constitutionality was affirmed. At the Territorial election two years ago a considerable number of Mormons withdrew from the church just before the election; others more defiant, took the oath, registered, and voted without the formality of withdrawal. It was alleged that those who had severed their connection with the church, soon after election, united with it again. As a result of their disregard for the oath many indictments were found and arrests made. Samuel D. Davis was placed on trial and found guilty as charged in the indictment and was sentenced to fine and imprisonment. The defendant applied for and obtained a writ of habeas corpus. The court held that sufficient cause was not shown for the discharge of the defendant and he was remanded to the custody of the sheriff. From this judgment the defendant appealed to the Supreme Court of the United States. On February 3, 1890, the Supreme Court affirmed the judgment of the court below, thereby establishing by the court of highest resort the constitutionality of the test-oath which disfranchises in this State all bigamists and polygamists and those adhering to their faith and practice. I inclose the opinion of the Supreme Court and respectfully request that it be published in the appendix to this report.

Section 3, suffrage and election, of the constitution of the State of Idaho is very rigid on this question, viz:

SEC. 3. No person is permitted to vote, serve as a juror, or hold any civil office who is under guardianship, idiotic, or insane, or who has at any place been convicted of treason, felony, or embezzlement of the public funds, bartering or selling or offering to barter or sell his vote, or purchasing or offering to purchase the vote of another, or other infamous crime, and who has not been restored to the rights of citizenship; or who at the time of such election is confined in prison on conviction of a criminal offense; or who is a bigamist or polygamist, or is living in what is known as patri-

archal, plural, or celestial marriage, or in violation of any law of this State or of the United States forbidding any such crime; or who, in any manner, teaches, advises, counsels, aids, or encourages any person to enter into bigamy, polygamy, or such patriarchal, plural, or celestial marriage, or to live in violation of any such law, or to commit any such crime; or who is a member of or contributes to the support, aid, or encouragement of any order, organization, association, corporation, or society, which teaches, advises, counsels, encourages or aids any person to enter into bigamy, polygamy, or such patriarchal or plural marriage, or which teaches or advises that the laws of this State prescribing rules of civil conduct are not the supreme law of the State; nor shall Chinese or persons of Mongolian descent, not born in the United States, nor Indians not taxed, who have not severed their tribal relations and adopted the habits of civilization, either vote, serve as jurors, or hold any civil office.

The principal opposition to the admission of Idaho was on account of the provision of the foregoing section of the constitution. Several leaders of the Mormon Church, assisted by able counsel, appeared before the Senate and House Committee on Territories when the bill for the admission of Idaho was pending and opposed admission with all the determination and skill that legal talent could command. Idaho was admitted, however, without amendment to the above section, and it is now one of the provisions defining suffrage and qualification of electors in the constitution of the State. In justice to the people of this organization I must say that no effort was made by them to vote at the late election. To all appearances they have resolved to accept the opinion of the Supreme Court and to abandon bigamy and polygamy.

The recent official manifesto of the president of the Mormon Church counseling against the further practicing or teaching these crimes may ultimately affect their legal standing and prepare the way to a restoration to citizenship. This will be fortunate or unfortunate as the Mormons themselves shall determine. If they shall forget their church and their priesthood when they commence to exercise their duties as citizens; if they study the constitution of the United States, the constitution of the State of Idaho, and the logic of our political institutions generally; if they follow the example of intelligent Americans, acquiring independent political convictions and affiliate with national political parties as the force of honestly conceived opinions may dictate; if they abandon the habit of following the commands or counsels of church leaders, who may corruptly bargain away their votes, and as citizens hold themselves loyal to the Government under whose protection they live, then, and only then, will they be welcomed to a participation in public affairs and the ballot be to them a safeguard and help. The old-time exclusiveness of the Mormon Church in all that pertains to social and business life has made the settlement of non-Mormons among them undesirable, but with the adoption of loyal principles and habits of thought they will make better neighbors and better citizens.

In severing my connection with you and your Department as Territorial governor, I beg to express to you my sincere and most earnest thanks for the courteous kindness I have at all times received. I also desire to thank you in behalf of the people of Idaho for the deep interest you have manifested for their welfare and prosperity.

I have the honor to be, with great respect, your obedient servant,

GEO. L. SHoup,
Governor.

Hon. JOHN W. NOBLE,
Secretary of the Interior, Washington, D. C.

REPORT OF THE GOVERNOR OF NEW MEXICO.

SEPTEMBER 15, 1890.

LAND TITLES.

Until the titles to the Spanish and Mexican land grants in the Territory are finally settled, the subject must continue to be of paramount importance and the first to be considered in any statement of the condition or needs of New Mexico.

More than forty years have passed since this Territory was acquired by the United States; for thirty-six years the plan of adjudication contemplated by the act of July 22, 1854, has been in operation, and yet but little, comparatively, has been accomplished toward the settlement of these titles. Down to July 1, 1890, 213 grants have been presented to the surveyor-general for action; in 162 cases he has taken testimony and made reports to the Interior Department. Previous to 1870 Congress acted on 44 of these cases, during the next decade it acted on only 1, and since 1879 it has not attempted to consider any cases whatever. No reasonable man expects that Congress will ever again find time to pass upon the remaining 117 grants, reports upon which have been laid before it during the last twenty-five years, and far less on the unknown number that have never yet been presented to the surveyor-general, and so the preposterous plan of having the National Legislature of sixty millions of people, sitting over 2,000 miles away and overwhelmed with other business, adjudicate questions of title involving a knowledge of foreign law, the examination of scores of manuscript documents, and the careful weighing and comparing of evidence, has so signally failed to accomplish its objects that all must now admit that its day of usefulness is over. Indeed, so fully is this understood in the Territory that during the last year but one new case was filed with the surveyor-general, and that came from an Indian Pueblo.

As long ago as May 29, 1858, the House Committee on Private Land Claims, in reporting in favor of the confirmation of fourteen grants, frankly admitted the utter impracticability of doing justice under the existing law, and based its recommendation on the ground that immediate confirmation, even without proper investigation, was the least of two evils. The report says: (Report No. 457, first session, Thirty-fifth Congress.)

It appears that a number of these claims were before the Committee on Public Lands of the last Congress, but, from some cause, no action was taken thereon by the committee nor by Congress. Those claims, with others since forwarded by the surveyor-general of the Territory, have received the most careful attention your committee could give them; but, in justice to the committee, I must say this examination has been confined entirely to what seemed to be the principal papers in each case, having no time to scrutinize the evidence and the application as made by the surveyor-general of the Spanish and Mexican laws and usages to each of them in detail. Nor will it ever be in the power, hereafter, of any committee of this House to make such an examination as will be entirely satisfactory, should these claims be allowed to accumulate before Congress.

But for the gross injustice to the people of New Mexico of delaying for an indefinite period action upon their claims, and the certainty that under existing arrangements Congress can never consider them under more favorable circumstances than at this time, your committee would not have been willing to report upon any of these individual claims, for the reason first stated—want of time to examine fully, and the unknown quantity of land claimed by most of the parties.

Soon after the printing of this report, Congress, on December 22, 1858, passed its first confirmatory act by which it confirmed the titles to five grants (Nos. 2, 5, 7, 11, and 13).

The next action was taken June 21, 1860, when thirty-one grants were confirmed at once (Nos. 1, 3, 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, and 38).

The subsequent confirmations were as follows: March 1, 1861, one (No. 43); June 12, 1866, one (No. 40); March 3, 1869, five (Nos. 41, 42, 44, 46, and 47); July 1, 1870, one (No. 48); January 28, 1879, one (No. 64).

So that only eight have been acted on in thirty years, and but one in the last twenty years.

Through all this long period the people of New Mexico have begged for a tribunal which could quickly and justly adjudicate as to these grants. It is not the fault of the Territory or its people that uncertainty of title exists here. If the matter had been left to be settled in the local courts, as similar questions would be adjusted in the older States, no great difficulty would have ensued and titles would have been determined a quarter of a century ago. But the United States chose to claim that all titles were invalid, though they might have existed without dispute for over a hundred years, until they should be submitted to the action of Congress, based on a report to be made by the surveyor-general.

Since the utter inadequacy of this plan has become apparent, it has been generally conceded that another must be devised; but differences of opinion between the two Houses of Congress as to methods of procedure have prevented the adoption of any practical system. The House of Representatives has several times passed a bill for the creation of a commission somewhat similar to that which existed in California, to settle these titles, only to be met by the objections of the Senate, which insists that they should be adjudicated by the existing courts. The people of the Territory, while possessing strong opinions as to the best way of meeting the difficulty, have been so exceedingly desirous of practical relief that they preferred the adoption of any system, however imperfect, to the existence of none at all. During the past year encouraging progress has been made toward the attainment of the desired result, and the adoption of a method of adjudication generally satisfactory to the people.

In this regard we feel under special obligation to the present administration, as the first which has seemed to comprehend the necessities of the situation, and certainly the first which has taken practical steps to meet them.

The President, in the annual message to Congress of December 1, 1889, formally drew the attention of that body to the subject in the following words:

The unsettled state of the title to large bodies of lands in the Territories of New Mexico and Arizona, has greatly retarded the development of these Territories. Provision should be made by law for the prompt trial and final adjustment, before a judicial tribunal or commission, of all claims based upon Mexican grants. It is not just to an intelligent and enterprising people that their peace should be disturbed and their prosperity retarded by these old contentions. I express the hope that the differences of opinion as to the methods may yield to the urgency of the case.

While this recommendation was necessarily brief, it was emphatic and comprehensive; and particularly valuable, as it pointedly alluded to the real cause of the long delay by asking that mere "difference of opinion as to methods may yield to the urgency of the case."

The more extended discussion of this subject in the Report of the Secretary of the Interior, the clearness with which the injustice of the failure of the Government to provide adequate means for adjudication was set forth, and the forcible argument in favor of early action therein contained, could not fail to produce an effect. The whole matter could not be more concisely summed up than in the sentence:

The present system being ineffective and inadequate in my opinion, the object of this communication is to respectfully suggest, if you approve, that you call the attention of Congress specially to the subject, and urge upon it the necessity of further legislation, so that these grants may be disposed of within a reasonable time.

The meeting of Congress was quickly followed by the introduction of bills for the purpose of establishing a land court, by Hon. Antonio Joseph, the Delegate from New Mexico, Hon. James B. McCreary, of Kentucky (H. R. 376, December 18, 1889, and Hon. Charles P. Wickham, of Ohio (H. R. 4613, January 13, 1890), in the House; and by Senator Ransom (December 10, 1889, S. 1042), and Senator Wolcott (December 16, 1889, S. 1321) in the Senate. On April 28, 1890, Mr. Wickham, from the Committee on Private Land Claims of the House, as the result of the deliberations of that committee, reported a bill entitled as follows: "H. R. 9798, a bill to establish a United States land court, and to provide for a judicial investigation and settlement of private land claims in the Territories of Arizona, Utah, Wyoming, and New Mexico, and in the States of Colorado and Nevada," and on the same day Senator Ransom, chairman of the similar committee of the Senate, reported the bill introduced by himself, and amended by the committee, entitled "A bill to establish a United States land court, and to provide for the settlement of private land claims in certain States and Territories" (Senate Bill 1042). While these bills differ in details, and also in some important particulars, still they agree in the general principles involved; and on their passage by the respective Houses of Congress there is little doubt that the differences can be harmonized in a conference committee. The interests of New Mexico so imperatively demand the enactment of some measure of this kind, that the people will be content with the passage of any act which will practically accomplish the result desired. All recognized, however, the danger which lay in the difficulty of obtaining consideration of the bills in time to secure the passage of some measure by both Houses before the close of the session.

Here again the acts of the administration have been most effective and welcome.

On the 1st of July the President sent to Congress a special message on the subject, accompanied by a copy of correspondence between the Department of State and the Mexican Government, and a report from the Secretary of the Interior. The latter embodies a list of the New Mexican grants reported by the surveyor-general but not acted on by Congress, one hundred and eleven in number, and containing 6,643,938 acres, which are withdrawn from entry until a final decision is rendered as to their title; and the report itself very clearly sets forth the existing situation and the need of speedy relief. "What is most needed," says the report, "is legislation that will put in motion machinery which, within a reasonable time, would settle finally public and private rights growing out of said claims."

The message of the President urges immediate action by Congress, and concludes as follows:

The entire community where these large claims exist, and all of our people are interested in an early and final settlement of them. No greater incubus can rest upon

the energies of a people or the development of a new country than that resulting from unsettled land titles. The necessity for legislation is so evident and so urgent that I venture to express the hope that relief will be given at the present session of Congress.

The effect of a special message of this nature could not but be excellent, and we confidently look for the passage of some measure of relief before the expiration of the present Congress.

While on the subject of land titles I may perhaps be permitted to make two suggestions.

(1) If nothing else is done by Congress, much good could be accomplished by a simple limitation of the time in which grants may be presented for confirmation. If this had been done years ago, it would at least have enabled us to know what land is not claimed under any grant, and thus have rendered it perfectly safe for those desiring to settle upon Government lands. At present there is no way of being certain, with regard to any particular piece of land, that some one will not produce a grant covering the tract, perhaps long after a settler has occupied and improved it. On the official maps at the land office it may appear as an unclaimed portion of the public domain; an entry may be made in good faith, and legal residence follow, all to be rendered fruitless by the subsequent appearance of an ancient grant, of the existence of which the occupant had never heard.

It is impossible now to remedy the omissions of the past, but at all events no further delay should take place in the establishment of such a limitation.

(2) As to small holdings. While public attention has been chiefly attracted to the settlement of the title to the large grants made under the Spanish and Mexican Governments, a much larger number of people than those affected by the grant titles are interested in what may be called the "small holdings."

These exceed five thousand in number, and are the property of the farmers and peasantry of the country. The bills before Congress contain provisions as to the title of these small tracts, and properly provide that they shall be settled with as little expense as possible to the occupants. But in two respects these bills are imperfect, both subjects being those as to which one not acquainted with the peculiarities of New Mexican colonization would be likely to err. One is the provision which limits the confirmation of such tracts to those on which the claimant is "residing as his home," and the other that which confines the confirmation to one tract for each claimant.

First. The cultivation in New Mexico is mostly by irrigation and is consequently confined, as a rule, to strips of land along the rivers and limited in width to the distance between the irrigating ditch or acequia and the river itself. Colonization was usually made by a number of families coming at the same time into an unoccupied valley and taking possession of the land either under grant or by expressed authority of the local Alcalde, or by arrangement among themselves. In either case land was apportioned among the heads of families, each one receiving a certain width of river frontage. We will suppose, for instance, that a valley 5,000 varas in length (somewhat less than 3 miles) was colonized by fifty families. If they received equal portions each would have a frontage width of 100 varas running back to the foot-hills, which are the natural lines of the acequia. But for purposes of protection against the Indians, the houses were usually built at a central point, forming a village or plaza. It will be observed, therefore, that while these little farms have been actually occupied and used in many cases for hundreds

of years, yet in numerous instances the owner has not resided on the farm but in the central village a short distance from it. This will show the propriety of striking out the words "residing thereon as his home," as that language would exclude from the benefits of the act a vast number of bona fide owners and occupants who, through their ancestors, have held such farms for generations.

Second. As generations have succeeded each other, these farms have been subdivided between the heirs of the original owners. This subdivision is almost always made by dividing the width, because a piece of land to have value in an irrigated country must extend from the acequia to the river. So supposing that the original owner of a tract of 300 varas in width, left six heirs, each would become the possessor of a strip 50 varas in width, and if one of these heirs in turn left five children each of them would receive a strip only 10 varas in width. By this means many of the present holdings have become exceedingly narrow, and I have recently seen a deed of one only $4\frac{1}{2}$ varas (12 feet) wide, while about 1,500 feet in length. Now, we will suppose that the owner of one of these little strips marries the owner of another similar strip and that they have one child as heir. He would naturally own both pieces and would occupy and cultivate them, although they might be a mile apart. That is the actual condition of things in hundreds of cases. The total area of all the pieces so owned by one person probably would not exceed 5 or 10 acres, but they are separate one from another, and the language of the bill which limits confirmation to one tract would cut off the owner from a part of that to which he has an absolute right.

It may be added that in the opinion of many no patent is necessary to vest a perfect title in the present owners of the tracts. The title which they now have is precisely of the same nature as the ordinary titles to land in New York or New England or any of the older States in which the United States never had any public domain and where consequently titles are not derived from United States patents. They can be traced a sufficient distance to make them good against all the world, and they are absolutely good as against individuals. The only difficulty regarding them is because they are continually menaced by the United States. On the official maps they appear to be Government land, and an unprincipled person can make an entry consequently in the proper land office directly on top of a farm and residence which have been held and occupied for hundreds of years, and through half a dozen generations.

Such a condition of things is palpably unjust and unworthy of the American Government. All that is required, in my judgment, with regard to these small holdings, is that the United States surveyors should delineate them on the official plats as private property, so that they would be distinctly segregated from the public domain, and that the United States would thus renounce all claim to their ownership. If this is done there will be no difficulty as to the titles as between individuals.

STATEHOOD.

In my report of 1889 I alluded to the feeling of disappointment and almost of indignation experienced in New Mexico when four other Territories, several of which were her juniors in age and inferior in other respects, were admitted into the Union in the spring of that year, and

she was not included in the number. That feeling has naturally been heightened by the action of the present Congress in admitting in advance of New Mexico two other Territories, each greatly our inferior in population, in wealth, in resources, in productions, in the substantial character of its people, and in nearly every feature necessary to the building up of a prosperous and successful statehood. The injustice of the action is too obvious to require characterization. Meanwhile the people of the Territory have been proceeding in a dignified manner to perfect every preliminary that could possibly be required as a requisite to admission, and to prepare themselves to take a position in the Union corresponding with their history, their character, and their real importance, whenever the time shall arrive, leaving to Congress the responsibility of their deprivation of the rights of self-government.

The constitutional convention provided for by the last legislature met on September 3, 1889, and continued in session until the 21st. It was composed of men of the highest character and ability who patiently devoted their time and talents to the great work intrusted to them without any compensation whatever. The result was worthy of such a body, and reflected honor on the Territory at large, the constitution prepared being without doubt the best one yet formulated in the United States. Wherever it has been read it has elicited the highest praise from all competent authorities. Copies of it were laid before the houses of Congress, and several bills introduced for the admission of the new State, but as yet no definite action has been taken. Meanwhile the convention reconvened on August 18, 1890, continued in session three days, perfected a few sections to which amendments had been suggested during the year, and provided for the submission of the constitution to a vote of the people on October 7, 1890.

POPULATION.

The census taken during the present year has been concluded so far as population is concerned, with the exception of the enumeration of the Navajo and Apache Indians. The reported result is inserted herein by counties and census districts, and it shows a total population of—

The estimate made by the bureau of immigration in 1889 was 204,090; that of the United States Treasury expert, for 1888, was 183,210, and that which I reported a year ago was 195,500. These estimates were based on the voting population as shown by elections and registrations, and judging by them, the most conservative computation will make the population over 185,000. The total vote at the election of 1880 was 20,397, and the population was then 119,565. In 1888 the vote was 30,510, almost precisely 50 per cent. more than in 1880. Adding the same percentage to the population will show that it amounted to 179,347 in 1888.

The number of votes at successive elections has increased with great regularity. They are as follows:

1874.....	15,781	1882.....	*21,728
1876.....	17,009	1884.....	27,086
1878.....	18,797	1886.....	28,589
1880.....	20,397	1888.....	30,510

The total registered vote in 1888 was 42,871. Of course the ratio of population to voters is less here than in the East, on account of the number of miners and others without families, but on the other hand, it must be remembered that families of Mexican parentage contain on

the average more children than ordinary American families, so that the difference in the ratio, when the whole population is considered, is not as great as it might appear at first sight. At all events, no one will consider that four to one is too high a proportion, and that will give a population among those entitled to vote of 171,484, and adding thereto 8,278 Pueblo Indians brings it up to 179,762, almost exactly the number found by the other method as the population in 1888.

From the best sources of information, therefore, I believe that the population of New Mexico, exclusive of tribal Indians, is certainly not less than 180,000 and probably 185,000.

We may safely say that the population of New Mexico which should appear by the census is not less than 180,000. This does not include the Apache and Navajo Indians. Of the former there are 462 at the Mescalero Agency, and 721 at the Jicarilla Agency, making 1,183 in all. The Navajos are estimated to number 15,000 to 20,000, but as the re-education is partly in New Mexico and partly in Arizona it is impossible to say with accuracy how many are in either Territory. As nearly as can be approximated there are 11,000 of the Navajos in New Mexico, which with the 1,183 Apaches makes 12,183 in all of tribal Indians.

The population by counties, according to the census, is as follows for 1880 and 1890 (exclusive of tribal Indians):

County.	1880.	1890.	County.	1880.	1890.
Bernalillo.....	17,225	20,388	San Miguel.....	20,638	24,167
Cofax.....	3,398	7,951	Santa Fé.....	19,867	13,792
Doña Ana.....	7,612	9,157	Sierra.....	.....	3,925
Grant.....	4,539	9,659	Socorro.....	7,785	9,375
Lincoln.....	2,543	7,093	Taos.....	11,029	16,463
Mora.....	9,751	14,552	Valencia.....	13,995	14,322
Rio Arriba.....	11,023	11,502	Total.....	119,475	163,076
San Juan.....	.....	1,890			

The United States troops included in the above figures are:

Grant County, Fort Bayard.....	509
Lincoln County, Fort Stanton.....	191
Mora County, Fort Union.....	175
Santa Fé, Fort Murey.....	106
Valencia County, Fort Wingate.....	480

The Pueblo Indians are as follows:

Bernalillo County, Cochiti, Santo Domingo, San Felipe, Sandia, Santa Ana, Zia, Jemez, and Isleta.....	3,478
Rio Arriba County, San Juan.....	406
Santa Fé County, Tesuque, Pojunque, Nambé, San Ildefonso, and Santa Clara.....	563
Taos County, Taos and Picuris.....	509
Valencia County, Laguna, Acoma, and Zuni.....	3,322

The population of the principal towns, so far as they can be separated from surrounding precincts, is as follows:

Santa Fé.....	6,039
Albuquerque (new town).....	3,794
Albuquerque (old), Griegos and Candelarias.....	2,965
East Las Vegas.....	2,310
Las Vegas (North and South).....	2,383
Las Cruces.....	9,518
Silver City.....	2,279
Socorro and San Antonio.....	2,591

* Partly estimated on account of votes disallowed by Congress.

Raton and Buena Vista.....	2, 106
Fernandez de Taos.....	1, 712
Mesilla and Bosque Seco.....	1, 642
Gallup.....	1, 204
Deming.....	1, 181
Pinos Altos.....	1, 013
.....

NATIONAL PARK.

The surveyor-general has recommended that a tract on the Upper Pecos, embracing townships 17, 18, 19, and 20 north, of ranges 11, 12, and 13 east, shall be withdrawn from entry in order to be set apart as a national park. Numerous signed petitions have been sent to Congress asking the necessary legislation to obtain this end, and the people of New Mexico are practically a unit in desiring it. The tract described is admirably adapted to the purpose. It is principally composed of mountains intersected by cañons, with the Pecos running southerly through the center. The scenery is magnificent, the climate admirable, the hunting and fishing exceptionally good, and, if looked at from a more practical point of view, the preservation of the timber is essential to the successful irrigation of the fertile lands of the Pecos Valley. I heartily concur in the hope that these townships may be speedily withdrawn from entry, that no damage may be done or new private rights intervene before Congressional action can be had.

TAXABLE PROPERTY.

The total assessed valuation of the property in the Territory in 1887 was \$45,462,459; in 1888 it was \$45,690,723, and in 1889, \$46,041,010.

The assessment for counties for 1889 was as follows:

Bernalillo.....	\$6, 169, 653. 47
Colfax.....	4, 454, 557. 88
Dofia Ana.....	3, 698, 038. 18
Grant.....	5, 012, 750. 00
Lincoln.....	3, 774, 585. 00
Mora.....	2, 422, 312. 73
Rio Arriba.....	1, 194, 780. 00
San Juan.....	665, 228. 79
San Miguel.....	7, 680, 202. 75
Santa Fé.....	3, 235, 600. 00
Sierra.....	2, 119, 772. 68
Socorro.....	3, 650, 856. 08
Taos.....	921, 500. 00
Valencia.....	1, 041, 173. 25
Total.....	46, 041, 010. 81

The Territorial indebtedness is as follows:

Outstanding warrants.....	\$150, 960. 94
Capitol building bonds.....	200, 000. 00
Penitentiary building bonds.....	120, 000. 00
Capitol contingent bonds.....	50, 000. 00
Current expense bonds.....	150, 000. 00
Provisional indebtedness bonds.....	200, 000. 00
Total.....	870, 960. 94

The financial condition of New Mexico is remarkably good, owing in large measure to the financial act passed by the last legislature.

The expenses of the Territory during the fortieth fiscal year ending March 3, 1890, were \$149,430.39. The estimated expenses of the present year are \$160,000. The auditor reports that there will be a surplus of

over \$40,000 in the treasury at the end of this fiscal year; and this, under the law, will be applied to the liquidation of outstanding warrants. During the past year \$30,000 of penitentiary bonds were redeemed and canceled; \$20,000 in July, 1889, and \$10,000 about six months thereafter. They were bought after ample advertisement in New York, San Francisco, and other cities, but as they bore 7 per cent. interest, had a number of years to run, and were held by very few parties, the Territory could not obtain them at a lower rate than 117. While this was an unpleasantly high price to pay, yet it speaks well for the general credit of New Mexico.

RAILROADS.

Of actual railroad building within New Mexico, there has been very little during the past year. In fact the only piece of road actually constructed is in Colfax County, and designed to connect Trinidad with the extensive lumber region of the Maxwell Grant. It is being constructed by the Denver, Texas and Ft. Worth Railroad, and is a continuation of the road built in 1888 from Trinidad to Martinsen, a distance of 14 miles. The mileage in New Mexico now contracted for, and to be completed before November 1, is about 30 miles.

The road in process of construction southerly from Deming has not progressed since my last report. About 25 miles are graded, but it is awaiting action looking to its extension to the Pacific coast before being put in order for travel.

The most important railroad enterprise of the year is the Pecos Valley Railroad, which starts at Pecos City, in Texas, on the Texas Pacific Railroad, 215 miles east from El Paso, and proceeds thence up the valley of the Pecos River through Eddy and Chavez Counties to Eddy and Roswell. This will be the means of bringing a large population and great prosperity to the Pecos Valley, where the great irrigating enterprises make an enormous production possible as soon as it can find an outlet. This railroad is being very rapidly constructed northward from Pecos City, and is expected to reach Eddy during the year, but as no part of it is as yet built within the borders of New Mexico, it does not add to our present railroad mileage.

The present railway lines in the Territory are the Atchison, Topeka and Santa Fé, the Atlantic and Pacific, the Southern Pacific, the Denver and Rio Grande, the Denver, Texas and Ft. Worth, the Santa Fé Southern, and the Arizona and New Mexico.

The mileage is as follows:

Atchison, Topeka and Santa Fé:	
Main line, north and south (1879-'81).....	303.1
Lamy to Santa Fé (1880).....	18
Blueon to Deming (1881).....	53
Dillon to Blossburg (1881).....	5.9
Nutt to Lake Valley (1884).....	13.3
Socorro to Magdalena (1884).....	22.1
Magdalena to Kelly (1885).....	3.9
San Antonio to Carthage (1882).....	9.6
Las Vegas to Hot Springs (1882).....	6.4
Hot Springs westward (1887).....	1.9
Silver City Branch.....	48
	<hr/> 690.20
Atlantic and Pacific:	
Main line (1881).....	166.60
Sidings (188-).....	22.25
San José Quarry spur (1888).....	3.41
	<hr/> 192.26

Southern Pacific:

Rio Grande to Deming (1881).....	73.46	
Deming to Arizona line (1880).....	93.76	
		167.22

Denver and Rio Grande:

Colorado line to Española (1880).....	85.86	
Between Antonito and Durango (1880).....	69.03	
Tres Piedras lumber branch (1885).....	2.15	
Chama lumber branch (1888).....	3.16	
		160.47

Denver, Texas and Fort Worth, in New Mexico.....	83.30	
Santa Fé Southern, Española to Santa Fé.....	39.00	
Arizona and New Mexico, Lordsburg to Arizona line, about.....	32.00	

Total.....1,364.45

CLIMATE AND RAIN-FALL.

As remarked last year, the climate of New Mexico is no doubt the most delightful and healthy in the country. Much has been written on this subject by physicians and others, so that it is not necessary to recapitulate the facts.

The only Signal Office station in the Territory is at Santa Fé. The report of temperature and precipitation of moisture at that station during the past year is as follows:

Month.	Temperature.				Month.	Temperature.			
	Max.	Min.	Mean.	Precipitation.		Max.	Min.	Mean.	Precipitation.
1889.					1890.				
August.....	85	54	70.9	1.43	January.....	58	2	32.2	.42
September.....	83	29	61.	.67	February.....	67	6	36.6	.88
October.....	78	28	52.1	.37	March.....	63	9	42.	.69
November.....	60	13	35.2	.43	April.....	67	17	47.8	2.08
December.....	59	10	39.3	.26	May.....	80	37	59.2	trace
					June.....	86	36	64.7	.13
					July.....	90	48	69.8	2.46

The total precipitation during 1889 was 7.89 inches, being 2 inches more than the average. The month of May of this year was the driest since observations were commenced in 1872, but April was exceptionally wet.

IRRIGATION.

The great importance of this subject to New Mexico has been so fully considered in previous reports that it is unnecessary to dwell upon it now. No subject has been more prominently brought before the people of the United States for the last few years than this general one of irrigation, as affecting the whole country. And this is both natural and proper.

Considering all that portion of the country in which the average rain-fall is less than 20 inches annually as "arid," we have an area in which irrigation is required of about 1,000 miles square. Within this vast region the public lands are estimated to contain 1,388,705 square miles or 888,771,348 acres.

The importance of a system of artificial irrigation and water storage, by which a large proportion of this vast area can be rendered valuable,

is too evident to require argument. The people of this "arid region" feel that they are as much entitled to national aid in this work as are their fellow citizens in other sections to their appropriations for the improvement of rivers and harbors. The act of October, 1888, however, in so far as it withdrew large portions of the public domain from entry and settlement, was injurious and exceedingly unpopular, and the recent repeal of the obnoxious provisions met a practically universal approval throughout this portion of the country.

AGRICULTURE AND HORTICULTURE.

The crops of all kinds are fully up to the average and a larger acreage has been planted than during the preceding years. Still with all its advantages of soil, climate, and facilities for irrigation, the Territory is not raising sufficient either of grain or vegetables to supply its own wants and so presents to-day the best field in the whole country for the industrious farmer and market gardener, who will have a home market for their produce at prices which yield a large profit. This subject will be considered more at length under the head of "Undeveloped Resources."

Horticulture is destined, I believe, to be the great industry of the valleys of New Mexico. They seem to be specially made for the fruit-tree and the vine. The fruit produced here is superior to that of any part of the United States, combining the size and beauty of that of California with the high flavor of that of the East. Wherever it has entered a market it commands higher prices than any other.

As this is understood and appreciated, orchards and vineyards are being multiplied. It is estimated that 150,000 fruit trees have been planted in 1889 and 1890. Experiments made in the Mesilla Valley show that the most desirable foreign grapes come to perfection there with ordinary care. Among those succeeding best are the Muscat of Alexandria, Chasselas de Fontainebleau, rose Chasselas, flamed Tokay, rose of Peru, black Burgundy, Malaga, etc.

Ordinary foreign grapes, including the Mission grape which has been very largely grown in the Rio Grande Valley for a long period, do well in altitudes not exceeding 6,000 feet, and this year two varieties of Chasselas have fruited admirably at Santa Fé, where the altitude is 7,000 feet.

Every part of New Mexico, except some especially cold localities, is adapted to the cultivation of all American fruits, which is illustrated by the fact that the largest existing orchards are in Colfax County, in the extreme north, where that of M. W. Mills contains over 150 acres, and that of J. B. Dawson over 50, and in Doña Ana County, in the extreme south. San Juan County, in the northwest, bordering on Colorado and Arizona, is rapidly being planted with fruit. According to the estimate of Mr. William Locke, the San Juan member of the bureau of immigration, there are now from 600 to 800 acres in orchards. One single orchard, the "Sunnyside," at Farmington, contains 12,000 trees. The fruit is mostly sent to western Colorado for use in the mining camps.

The apple crop of Edward Miller, near Santa Fé, will reach 150,000 pounds this year.

Mr. A. D. Coon, of Socorro, has tried the experiment of raising fruit trees without irrigation, and the result is of much interest and value. He has now 4,000 apple, 1,000 plum, and other trees, all growing on

"first bottom land"—the level above the acequias—without irrigation, and with marked success.

As soon as the orchards now being planted come into bearing, New Mexico will take the first rank as a fruit-growing country.

STOCK-RAISING.

CATTLE.

The depression in this industry, which was alluded to in last year's report, has been succeeded by "better times." Prices have improved and sales have been very large.

The following statement by R. F. Hardy, esq., secretary of the Territorial cattle sanitary board, and editor of the *Stock Grower*, dated August 23, 1890, gives a concise view of the general situation:

The year 1890 has been variable for the cattle industry in New Mexico. Disastrous droughts prevailed through the early part of the year, and in many sections the loss of stock was heavy. At present the northern half of the Territory has been blessed with good rains, which have assured an abundance of pasture for the coming winter. Stockmen say that the range in the north half of the Territory is better than has been for ten years. In the southern counties of Grant and Doña Ana the rainfall has been plentiful of late, and the range will be good in that section. In the central part of the Territory the rains are reported in "streaks," some sections being favored while others are in very bad condition.

The loss of cattle during the past twelve months has been heavy. The principal cause for loss being the overstocking of the ranges. The spring drought exhausted the "transient" watering places, and brought all stock to the rivers and other permanent waters. The pastures in the vicinity of these watering places were soon consumed and considerable losses ensued. These losses were general and not confined to any one locality.

The market for steers opened early in the spring with a goodly number of buyers in the country. A general improvement in prices was noticed and the stockmen of the southern half of the Territory were enabled to dispose of their steers at better prices than had been obtainable for four years. The more northern stockmen were unable to sell their steers as they could not gather them, owing to the backwardness of the rainy season. Buyers now are taking the surplus stock from the North. The heavy sales of this year will be very beneficial, lightening the range preventing a recurrence of the losses of this spring. New Mexico steers are in good demand throughout the feeding districts on account of their well known freedom from disease and improved breeding. Prices this year have been satisfactory and higher than has been paid for several years. Two hundred and twenty-five thousand steers will be New Mexico's output in 1890. The average price received for this stock, on the range, has been \$9 for yearlings, \$12 for twos, and \$17 for three-year-old steers. The day of the trail is about over and it is safe to say that 95 per cent. of these cattle have been shipped out by rail. No disease of any kind has made its appearance among the cattle of New Mexico this year, and in this respect the record for health for five years has been unbroken. Commissions from other States have investigated the sanitary condition of our stock this year and in each case have returned fully satisfied that New Mexico cattle were as healthy as the best on the globe.

Importations of cattle into the Territory this year to August 1 were 361 head, all of which were fine dairy stock or bulls of high grade, brought in for breeding purposes. New Mexico ranchmen are improving their stock to a profitable degree.

SHEEP.

No industry in New Mexico is more prosperous at this time than that of sheep raising. Not only has the favorable legislation of Congress enhanced the price of wool to an extent which yields gratifying profits to the owner, but the demand for sheep for mutton has also greatly increased, causing a corresponding advance in prices. Mr. R. F. Hardy says:

This has been a good year for the sheep owners of the Territory. A steady demand for muttons manifested itself early in the year, and buyers from all of the feeding States came to New Mexico in search of stock. Six hundred thousand head, in round

numbers, have been sold and driven from the Territory, and before the close of the year the total will reach 750,000.

A remarkable feature of the trade has been the selling of ewes for breeding purposes to the farmers of Kansas, Iowa, Wyoming, and Minnesota. It has been discovered that the New Mexico sheep is unusually hardy and prolific, and for this reason our flocks are purchased as foundations for breeding by the sheep men of the older States.

The prices have been satisfactory, being an average of \$1.50 and \$2 for yearling and two-year-old wethers of common grade. Ewes have brought from \$2 to \$2.50, according to grade, with lamb thrown in. High grade wethers have brought as much as \$3.10.

The spring wool clip was in round numbers 6,000,000 pounds, and when the fall clip is in the year's production will reach nearly 10,000,000 pounds. The price of wool has ranged from 12 to 18 cents. The quality of the spring clip was excellent and shows much improvement in breeding.

Importations of sheep this year were limited to the bringing in of a considerable number of fine bucks from Vermont, Pennsylvania, Ohio, and other States. Numbers can not be given accurately, but it is evident that our sheep men are progressive and are grading up their flocks with the best blood that money can buy.

The dry spring injured the lambing, and a conservative estimate places the number of lambs saved at 50 per cent. of the ewes. The shortage of mutton throughout the United States has made the flock owners hopeful of the future, and contemplated legislation is expected to improve the price of wool.

Proceeding from the central counties to those of the northeast, Mr. Luis A. C. de Baca, of Mora County, gives a list of owners in that vicinity with the number of their sheep, amount of wool produced, prices obtained, and in many cases the number of lambs of this year, from which absolute facts a more perfectly accurate idea can be obtained of the condition of the industry in that section than from any generalizations.

Name.	Sheep.	Wool.	Price.	Lambs.
		Pounds.	Cents.	
Juan Rodriguez	5,000	12,000	17	2,000
Ramualdo Gonzales	3,000	10,000	17	1,000
Ramualdo Baca	1,800	5,000	.....	600
Valverde & Gallegos	1,000	3,000	.....	200
Gonzales Brothers	1,800	7,000	.....	1,000
Baca Brothers	15,000	40,000	18	5,000
Lujan & Pineda	27,000	80,000	18	10,000
State Apolaca	2,000	5,000	.....	800
Jose M. Martinez	1,800	6,000	17½	900
John Tinto	5,000	12,000	18	2,000
Pablo Padilla	5,000	15,000	16	.....
Ortega & Romero	1,500	5,000	16	900
Luis F. Garcia	15,000	60,000	.....	7,000
Mr. Holcomb	7,000	32,000	.....	3,000
Abelino Garcia	3,000	15,000	.....	1,500
Telosofo Casados	3,000	12,000	.....	1,200
Jose L. Garcia	2,000	10,000	18	1,000
Francisco Garcia	2,000	6,000	.....	1,200
Maximo Garcia	2,700	9,000	.....	1,800
Francisco Miera	1,700	4,000	18	600
Leon Shaw	7,000	35,000	.....	4,000
W. Frank	4,000	12,000	.....	2,000
Agapito Padilla	2,000	5,000	.....	800
Guadalupe Lovato	3,000	9,000	.....	1,800
Candido Garcia	4,000	10,000	.....	2,000
Mr. Snider	7,000	35,000	.....	3,000
Antonio Sanchez	3,000	9,000	.....	1,500
Juan Vigil	7,000	35,000	.....	5,000
Total	142,800	404,000	.....	65,700

MINING.

The prospects of the mining industry in New Mexico were never so bright as at present. This is owing to the intelligent and patriotic action of the present Congress. Our principal mineral product is silver, and the great majority of our mines are of low grade, the ore being an

argentiferous galena, carrying ten ounces or less of silver to the ton, but being very rich in lead. For several years, during the importation of similar ores from Mexico without the payment of duty, these mines in our Territory were necessarily closed, for it was impossible for us to compete in the production of these galena ores with the cheap peon labor of Mexico while our American miners were receiving from \$2.50 to \$3.50 per day. Perhaps no plainer illustration of the necessity of a proper tariff in order to protect American wages from being reduced to the level of those received by workmen of much lower grade in a foreign land can be suggested than that presented by lead. On one side of the Rio Grande is the intelligent, self-respecting American miner, accustomed to being well fed, well clothed, and to all the conveniences and many of the luxuries of American life, and with ambition to accumulate and become a mine-owner or otherwise independent himself. On the other side is the unintelligent and unambitious laborer, satisfied with the coarse food and hard living to which he is accustomed, and asking for nothing better. To subject the former to direct competition with the latter is to reduce him to the lower level or drive him to some other business. Of course he accepts the latter alternative, and so our mines have been closed.

But with the protection afforded by the tariff on lead, all this is changed, and the great low grade mines of the Magdalenas, Cerrillos, etc. will soon echo to the sound of the pick, and employ hundreds of well paid miners.

The recent silver legislation has likewise been of vast advantage to New Mexico, and the increase in the value of both silver and lead will create a greatly increased production during the next year.

The total output of the Territory during the year 1889, according to the report of Mr. W. C. Hadley, of Lake Valley, who is a very competent observer, was as follows:

County.	Gold.	Silver.	Lead.	Copper.	Total.
Colfax.....	\$100,000	\$14,000	.....	\$3,500	\$117,500
Mora.....	3,000	16,500	\$2,500	1,200	23,200
Santa Fé.....	37,190	91,225	61,867	537,372	727,654
Bernalillo.....	2,300	1,250	.....	4,950	8,500
Socorro.....	147,500	89,326	129,800	.....	366,626
Sierra.....	113,870	818,684	30,798	13,334	976,686
Lincoln.....	209,709	8,750	.....	.....	218,459
Dona Ana.....	4,956	82,000	70,800	.....	158,356
Grant.....	517,795	708,770	59,074	81,264	1,426,903
Total.....	1,136,320	1,891,105	354,839	641,620	4,023,884

The product of gold and silver in New Mexico, since 1881, as reported by the Director of the United States Mint, is as follows:

Year.	Gold.	Silver.	Total.
1882.....	\$150,000	\$1,500,000	\$1,650,000
1883.....	280,000	2,845,000	3,125,000
1884.....	300,000	3,000,000	3,300,000
1885.....	200,000	3,000,000	3,200,000
1886.....	400,000	2,500,000	2,900,000
1887.....	500,000	2,300,000	2,800,000
1888.....	602,637	1,414,400	2,017,037
1889.....	1,136,320	1,891,105	3,027,425
Total.....	4,169,957	18,550,505	22,719,462

FORESTS AND LUMBER.

On this subject there is no great change to be noted within the year. Rio Arriba County continues to be the largest lumber producing region. On the Tierra Amarilla grant there are three large saw-mills producing about 2,500,000 feet per month, taking the average for the entire year; at Amargo there are two mills producing about 1,000,000 feet per month; and near Tres Piedras, on the Petaca grant, another mill, with several miles of railroad connecting it with the lumber region, and producing about 1,000,000 feet per month. This region, covered by the Tierra Amarilla, Vallecito, and Petaca grants, is probably the most valuable for its lumber of any section of New Mexico. A portion of the Maxwell grant is covered with very superior timber, and it is to reach this that the Denver and Fort Worth Railroad has been extending its road from Trinidad southwesterly into Colfax County. A new town, called Catakill, has been established at the present terminus of this road. The Maxwell Land Grant Company has just concluded a contract under which they are to supply 200,000,000 feet of lumber, to be delivered during the next five years.

The west part of Mora County is covered with forests of great value, and several saw mills are kept actively at work in that vicinity. As railroads are multiplied, various localities, now little known, and from which it is impossible to transport heavy freight, will become prominent as lumber producers.

* * * * *

UNDEVELOPED RESOURCES.

Under this head, a year ago, I drew attention to the manifold resources of New Mexico, so varied and so abundant that it could be truthfully asserted that no other portion of the United States is so richly endowed by nature. As this seemed such strong language as to savor of exaggeration, I proceeded somewhat in detail to make a comparison, in order to show that the picture was not overdrawn. I showed that the States east of the Mississippi while well equipped in most localities for agricultural and horticultural success by excellence of soil and abundance of humidity, yet as a rule were devoid of mineral resources. Along the Appalachian range there were great deposits of iron, and in certain sections abundance of coal, but of the precious metals the amount even in North Carolina was so small as to be insignificant. Michigan contained magnificent mines of copper, but had no other mineral wealth. Crossing the Mississippi we found in Missouri great masses of lead and zinc, but of more valuable metals she had none. Proceeding westward to the Rocky Mountain region, it is true that Colorado, by her early development excelled us in mineral product, but when we turned to other resources she had nothing to compare with the fertile valleys of our rivers, and in the productions of the field, the market garden, the orchard, and the vineyard, New Mexico was immensely superior. The gainsayer, baffled thus far in finding a land so favored as our own, might then turn to California, and portraying her wonderful advantages insist that at least that State was superior. And at first sight it would almost seem as if this were true. For besides her marvelous record as the land of gold, she possessed the enormous wheat fields of the north and the center, and the magnificent fruit and grape regions of the south. But in these latter respects we are fully her equal, and her mineral is nearly all of one metal. She

has not our silver, or lead, or copper, or iron. And beyond all this, the possession in vast and inexhaustible quantities of that great essential article, which is the motive power to set in operation so many branches of business, coal, gives to us the stamp of superiority that can not fail to be recognized.

I then proceeded to enumerate some of the wonderful resources and opportunities of production existing within our borders, for New Mexico is so large in extent that very few are aware of the latent wealth which lies awaiting development within our borders. There are the great pine forests from which, in a single county, over 50,000,000 feet of lumber are even now being produced each year. There are the wonderful wheat lands of the northern valleys which, though used uninterruptedly for over a hundred years without rotation, yet produce crops unsurpassed in India or Russia or our own Northwest. There are the long stretches of valleys bordering all of the great rivers and their tributaries which rival, if they do not excel, the prairie soil of Illinois or Kansas in the luxuriance of their fields of corn. There are the broad acres in alfalfa and other grasses, mere samples of what may be a vastly multiplied reality, producing by their successive crops a much larger weight of hay than can be raised on the same area in any of the most favored grass producing States. Our oats are greatly superior to those grown elsewhere. While those of Kansas average but 27 pounds to the bushel and seldom exceed 30 at the highest, ours, with their plump full kernels, will average 34 and often exceed 40. Our valleys excel in the production of every kind of vegetables except potatoes and they are produced of wonderful excellence on the mountain sides and in all the higher altitudes. And as to fruit, this seems to be the spot specially adapted by the hand of the Creator for its perfection. Whether apples or pears, peaches, apricots, or nectarines, plums, cherries, or quinces, all here exhibit their finest points of size, color, and taste, combining the weight and beauty of those of California with the richest flavor of those of the East. I do not recapitulate these things for the glorification of New Mexico, but with a special practical object, and that is to show that while possessing all these natural advantages our people are not using them even to the extent necessary to meet our own requirements. With every opportunity of supplying ourselves with all the staple articles and of exporting them to less favored States, we are not doing so, but are actually importing them in vast quantities from without. From this it follows that there is an extraordinary field here awaiting the industry and energy of those who shall come to occupy it.

The facts are really surprising, and will be presented here with some particularity, in order that they may be fully understood. Our wheat lands are unsurpassed, and more than amply sufficient for all of our home demand. Yet during the last year the Atchison, Topeka, and Sante Fé Railroad alone brought into the Territory 409 tons of wheat, and 8,897 tons of flour. The Atlantic and Pacific Railroad added 379 tons of flour, making 9,276 tons. This does not include that brought by the Southern Pacific Railroad from California, or by the Denver and Rio Grande Railroad and the Denver and Fort Worth Railroad from Colorado, which doubtless brings up the aggregate to 450 tons of wheat and 10,000 of flour. But considering only the imports by the first two railroads, the flour would make 371,040 sacks of 50 pounds each, or 18,552,000 pounds, besides 818,000 pounds of unground wheat.

Corn is the natural product of full three quarters of the Territory. Here it was found growing by Coronado in 1541, in such abundance that the historian of his expedition tells that "the harvest of one year

is sufficient for seven; when they begin to sow the fields are still covered with the corn that has not yet been gathered." And here, to-day, it is found not only of marvelous height in the well-watered valleys, but growing in many sections without irrigation at all. Yet we imported over the Atchison, Topeka, and Santa Fé Railroad 7,945 tons, and 90 tons from the west over the Atlantic and Pacific Railroad, making 8,035 tons of which we have accurate figures, besides what came in on the other three railroads, and also in addition to 143 tons of ground meal. Here, then, are over 16,000,000 pounds of corn and meal brought into New Mexico, which no doubt would exceed 20,000,000 if we had the full figures.

I have before alluded to the superior character of our oats, which should cause them to be raised in great quantities for exportation to less favored localities; but, on the contrary, the Atchison, Topeka, and Santa Fé Railroad carried to us, instead of from us, during the last year, not less than 3,487 tons.

And now we come to the article which should be our largest product. I refer to hay. Four crops of alfalfa is the usual yield in our valleys. Its long roots penetrating the soil to a depth where there is always moisture, and its permanence when once established, peculiarly adapt it to our conditions. There is no limit to the amount which can be raised. Every acre of land which is fairly irrigated will produce most abundant crops. We ought to supply a great section of country outside of our boundaries with their hay; and yet last year we imported over the two railroads from which we have returns, 7,904 tons from the east and 241 from the west!

These four articles are those of largest general consumption; but if we carry on the investigation, and look at those which may be considered of minor importance, we will see that the same results are found, of importations when we should not only supply ourselves but export in large quantities.

Everywhere in New Mexico where industry chooses to employ itself in the raising of vegetables, they are produced in great perfection. Everyone employed in their cultivation finds the business profitable, and yet the Santa Fé line alone brought 1,491 tons of vegetables from abroad into the Territory last year, for consumption here.

A still more startling exhibit is that regarding fruit. New Mexico is beyond contradiction the best section in the United States, we might almost say in the world, for both orchards and vineyards. Whenever we send our fruit to markets in which it meets that of California or other States it is greatly preferred, and the New Mexico product, of identical varieties, brings a price from 20 to 40 per cent. higher than that received by its rivals. We ought to export enough fruit to pay for all our imports of every kind, and yet during the last year, the Santa Fé route brought into the Territory 408,000 pound of green fruit and 675,000 pounds of canned goods. This came from the eastward, and the Atlantic and Pacific Railroad more than doubled the importation by bringing no less than 1,354,000 pounds of fruit in various forms from the west. Thus over 2,000,000 pounds of fruit were actually brought into this land of the peach, the apple, and the grape in a single year. The newsboys on the trains which pass directly through the Rio Grande Valley sell the fruit of California and not that of New Mexico to the passengers.

Albuquerque lies in the center of that valley, with large orchards both to the north and south, yet in that city one single firm imported this year no less than 1,400 barrels of apples from the east, and the

total amount brought there from beyond the territorial line was 2,500 barrels.

Some of the other unnecessary importations of the Territory can be estimated from the amounts brought into that same city. In a land of pastures and cattle they send money abroad for 280,000 pounds of butter and 40,000 pounds of cheese. In the midst of all that should make the raising of fowls easy and profitable, they imported 54,000 pounds of poultry and 2,880,000 eggs. They bought during the last year 1,500,000 pounds of potatoes, which could easily have been raised in the cañons and on the foot hills. Onions are produced all through the valleys, of great size and perfection, and yet even of these they imported 60,000 pounds. And when it is known that in this one town they bought 132,000 cans of various food products last year one may imagine how many canned goods were consumed in the whole Territory, and wonder why they were not raised and prepared at home. For Albuquerque is no exception among New Mexican towns. At Springer, close to the wheat lands of the Maxwell grant, they used 879,000 pounds of foreign flour, and 900,000 pounds of corn; at Wagon Mound, near the Mora valley, whose wheat fields are wonders of productiveness, the leading dealer imported 286,000 pounds of flour, and writes that "almost every merchant from Las Vegas northerly gets his flour and grain from the east;" and in Las Vegas, the "City of the Meadows," it is estimated that 200 car loads of flour, 100 of corn, and 75 of vegetables are consumed each year. The fact is that every day in the year trains of cars roll into the Territory, through the Raton tunnel and across the Colorado of the West laden with the products of other States, which we are to consume and for which we are to pay, while every one of them could be produced in great abundance and of better quality by our own people. The sum which we annually pay for the comparatively few articles which I have enumerated amounts to over \$1,200,000.

These would be sad facts if caused by any lack of capacity for production in New Mexico; as it is, they are simply suggestive and instructive ones. And the lesson which they teach is a double one.

Firstly, they should be an inspiration and incentive to our own people to utilize to a far greater extent the resources and advantages which they possess; and secondly, they show by absolute figures that can not lie, that New Mexico presents attractions to the industrious and energetic immigrant which are unknown elsewhere.

The man who goes to Dakota, may raise an abundance of wheat, but there is no local demand for the crop when matured, and in order to find a market he must send it to Chicago or some other center of trade. He is at the mercy of the railroads, for his product has to bear long transportation before it reaches any consumer. The value of the product on the ground is the price in Chicago, less the freight and various charges.

The raiser of corn in Kansas is in a similar plight. There is no home demand for his product. Every one has the same, and all have a surplus. To be turned into money, it also must go to a more eastern market and be governed by prices there. He, as well as his Dakota brother, is at the mercy of those who control transportation, and the value of his corn is the price in the eastern market, less the cost of transportation, the commissions and charges. Many a time, as is well known, corn is so cheap and coal is so high, that its most profitable use is to be burned as fuel. In New Mexico all this is reversed. Here is an actual demand for nearly 20,000,000 pounds of flour, which must be filled from somewhere, and now is supplied from abroad. This demand

does not have to be created, nor does it depend on the crops of Russia or India, but it exists right here in New Mexico. The raiser of wheat, therefore, runs no risk. He is sure of a market. And the market is at home. There is no long transportation involved, and so the railroads can not control or overcharge. The price is the price in Minnesota or Dakota, plus the cost of freight from there. The freight should constitute an ample profit.

And so of corn. The market is already here and must be supplied. Over 8,000 tons are necessary for that purpose, and the man who produces up to that amount is sure of a sale, close to his farm, and at the prices in Missouri or Kansas, plus the freight and charges involved in bringing it from there.

These are but examples. The same general facts exist as to the other articles that have been mentioned. In every case there is an actual home market existing in New Mexico, waiting for some one to supply it from our soil, and meanwhile being filled from abroad. All of the products named are among those most successfully raised in the Territory, and the only reason for the shortness of the supply is that no one is taking the trouble to raise them in sufficient quantity. This inadequacy of supply is increased in New Mexico on account of the large mining industry, which employs great numbers of men, who continually consume all kinds of food products while producing none.

Through most of the agricultural sections of the United States the farmer has great difficulty in finding some article which he can raise at a profit and with which the market is not already greatly overstocked; and after a year of toil is liable to find the general supply of his produce so great and the price consequently so low that he receives little or nothing for his labor and the use of his land. Here the market is ready and ample, and only awaits greater energy on the part of those already here, and the influx of intelligent and industrious producers to supply it. Nowhere is the reward of agricultural and horticultural enterprise so great and so certain.

THE "SUNSHINE STATE."

Some months ago, a Boston publishing house, preparing a geographical work, after asking information on various points connected with New Mexico, inquired as to its "pet name," as, in treating of each State, they had placed in the pictorial headings these familiar names, as "Granite State," "Bay State," "Empire State," etc.

I had to answer that New Mexico was not yet possessed of a "pet name," nor could one be adopted except by common consent; but I ventured to suggest that as it had been called "the land of perpetual sunshine," no more appropriate name could be found than "the Sunshine State." And so, for wider circulation, that may elicit comment and show how fully this meets the general thought, I repeat the suggestion here, for no part of the Union, by its climate and cloudless sky, is so fully entitled to this name of "the Sunshine State."

L. BRADFORD PRINCE,
Governor of New Mexico.

REPORT OF THE GOVERNOR OF UTAH.

TERRITORY OF UTAH,
SALT LAKE CITY, *September 9, 1890.*

SIR: In compliance with your request of July 28, 1890, I respectfully submit for your information the following report of affairs in Utah Territory during the past year:

A census of the inhabitants of the Territory was taken by the Government in the month of June last. I have not been able to secure an accurate statement of the population as shown by the returns now in the Census Office at Washington. From information furnished to me by A. S. Condon, supervisor of census for Utah, the population of the counties appears to be as follows:

County.	Population.		County.	Population.	
	1890.	1880.		1890.	1880.
Beaver.....	4,354	3,018	Salt Lake.....	50,521	31,977
Box Elder.....	7,722	6,761	San Juan.....	450	204
Cache.....	15,349	12,662	San Pete.....	16,600	11,557
Davis.....	6,788	5,279	Sevier.....	5,938	4,457
Emery.....	4,329	550	Summit.....	7,775	4,921
Gardfield*.....	2,469		Tooele.....	3,301	4,497
Grand.....	541		Utah.....	2,319	769
Iron.....	3,658	4,013	Utah.....	23,390	17,973
Juab.....	5,591	3,474	Wahatch.....	5,113	2,927
Kane.....	4,711	3,685	Washington.....	5,736	4,235
Millard.....	3,881	3,727	Weber.....	23,901	12,344
Morgan.....	1,696	1,783			
Pi Ute.....	2,821	1,651	Total.....	220,932	143,963
Rich.....	1,838	1,263			

* New county, created in 1882 from Iron County.

† New county, created in 1890 from Emery County.

‡ Indian reservation not included.

The above estimate does not include the military posts nor public and charitable institutions.

If this showing is correct the Territory has increased in population 77,019 since June, 1880; about 55 per cent.

The population in 1850 was 11,380; in 1860, 40,273 (increase 250 per cent.); in 1870, 86,786 (increase 110 per cent.); in 1880, 144,963 (increase 66 per cent.).

MORMON IMMIGRATION.

From the year 1881 to the year 1889 the foreign-born population of the Territory has been increased by Mormon immigration 16,094. During the present year the usual number of immigrants have arrived, mostly from Scandinavian countries. The average annual immigration to Utah of this character is about 1,800. It is very largely assisted immigration, many of the immigrants paying their passage money after their arrival here by installments, or as they are able to do so from their earnings.

POPULATION—ASSESSED VALUE OF PROPERTY AND INDEBTEDNESS OF CITIES AND TOWNS.

Statement showing the population of the incorporated cities and towns of Utah Territory, the assessed value of the property, and the indebtedness of the same for the year 1890 and for 1889, together with the population in 1880 and 1890.

	Assessed valuation of property.		Compared with assessment for county purposes.	Amount of indebtedness (1890).	Population.	
	1890.	1889.			1880.	1890.
<i>Cities incorporated under special charter.</i>						
American Fork	\$250,950	\$220,000	Less	\$1,100	1,825	2,070
Alpine	70,000	70,000	Lower	150	310	403
Beaver	284,878	251,171	Same	None	1,011	1,782
Brigham City	315,050	300,000	Lower	None	1,877	2,918
Cedar City	93,180	113,000	Lower	\$500	931	1,474
Coalville	193,000	146,000	Lower	None	911	1,260
Cortina	175,093	162,253	Lower	None	277	212
Ephraim	131,550	120,000	Lower	None	1,098	1,918
Fairview	74,000	80,000	Higher	None	863	1,020
Fillmore	111,000	100,000	Lower	\$1,200	987	980
Grantsville	147,022	150,000	Much lower ..	None	1,007	1,100
Hyrum	121,567	240,800	Half	None	1,234	1,300
Kaysville	219,106	250,000	One fourth ..	\$5,000	1,187	1,770
Lehi City	277,426	270,340	Half	None	1,538	1,903
Logan	1,647,278	(*)	Same	(*)	3,396	4,000
Manti	254,337	225,000	Same	\$0,000	1,745	1,987
Mendon	45,000	43,000	Lower	None	543	854
Moroni	70,180	90,000	Same	None	858	1,000
Mount Pleasant ..	200,000	180,000	Same	None	2,004	2,200
Morgan	(†)	127,980	(*)	None	433	580
Ogden	7,000,000	11,400,000	Same	\$150,000	6,000	14,219
Park City	1,120,350	621,508	(*)	(‡)	1,542	4,977
Parowan	101,380	100,000	Lower	None	957	1,072
Payson	265,000	228,000	Half	(†)	1,785	2,120
Pleasant Grove ..	321,000	228,850	Lower	None	1,775	2,140
Provo	3,150,430	1,000,000	Same	\$5,000	3,432	5,004
Richfield	139,539	143,521	Same	None	1,197	1,000
Richmond	75,000	110,750	Much lower ..	None	1,104	1,300
Salt Lake City ..	54,363,740	10,011,752	Higher	\$450,000	20,078	40,259
Smithfield	183,399	147,640	Lower	337	1,177	1,300
Spanish Fork	210,800	238,372	(*)	None	2,304	3,000
Spring City	100,000	67,200	Lower	None	980	1,210
Springville	420,000	420,000	Lower	None	2,312	2,847
St. George	249,005	242,315	Higher	\$014	1,332	1,500
Tooele City	117,500	107,000	Lower	2,000	918	1,072
Washington	50,000	53,700	Lower	None	493	500
Wellsville	114,097	100,000	Same	None	1,193	1,308
Willard	75,135	73,653	Lower	\$63	412	700
<i>Cities and towns incorporated under general laws.</i>						
Bear River	15,000	1,565	Same	None	340	310
Fountain Green ..	70,782	71,420	Lower	None	691	710
Heber City	(†)	(†)	(*)	None	1,291	1,492
Kanab	43,000	46,950	Lower	None	394	505
Montrose	75,000	71,000	(*)	None	744	940
Salem	47,317	5,000	Same	None	510	713
Nephis	827,324	(*)	Higher	\$12,000	1,707	2,084
Total	73,913,927	30,837,209		332,564	80,810	128,150

* No report.

† No assessment made.

‡ \$10,178 surplus on hand.

§ Surplus on hand.

The figures given above, of population for 1890, are based on estimates made by Dr. A. S. Condon, census supervisor for the district of Utah. The increase of value of property over 1889, as shown by the assessment rolls, is 139.6 per cent. The increase of indebtedness over 1889 is 27 per cent.

The increase of population, as shown by the figures above given, over 1880, is 58 per cent.

THE UNOCCUPIED PUBLIC LANDS.

I again invite attention to the vast amount of unoccupied lands, about 31,000,000 acres, owned by the Government in Utah Territory.

Under the law of October, 1888, sites for reservoirs have been reserved on which water may be stored to be used for agricultural purposes. It is anticipated that by means of these artificial methods a fair amount of land may be reclaimed. But natural conditions make it impossible to use much of the unoccupied lands for any other than grazing purposes. The people of Utah are largely interested in raising horses, sheep, and cattle. They have spent a large amount of money in improving their live-stock, and they are anxious to have the Government take some action that will enable them to acquire title to the grazing lands, or at least secure them in the use of them. This question will grow in importance with each succeeding year, and it would certainly be the part of wisdom to place these lands in the hands of people who are vitally interested in preserving the natural grasses which grow upon them. If these forage plants are destroyed the land will have no value.

I recommend that the title to these lands be vested in the Territory, the proceeds arising from the sales to be used for the improvement of the water-supply, or as an endowment for the public schools.

In support of this recommendation I again call attention to the unsatisfactory conditions under which the lands are occupied. The title being vested in the Government, they are looked upon as lands which may be used by any one. The result is that the man who to-day may find a place where he can feed and water his animals, may to-morrow find himself surrounded by other men with their animals, and in a short time the forage plants sufficient to maintain a limited number of animals are eaten out, or completely destroyed. Again, it is well known that between the cattle and sheep interests there exists a bitter antagonism, and it is proving to be a blight not only to these interests but to the Territory also.

If something is not done by the Government to protect these grazing lands, and to provide adequate protection to those engaged in raising live-stock, the time is not far distant when this valuable industry will be practically destroyed; a result which will seriously affect our food supply.

THE SCHOOL LANDS.

The total amount of the school land granted to the Territory is 46,080 acres. The water-supply has been appropriated for use on lands cultivated by the settlers, and when the school lands are offered for sale there will be no water to use upon them. This will render them or the greater part of them practically valueless.

I believe the grant should be increased and that the legislature should be authorized to take some action respecting the sale of the lands already granted.

IRRIGATION.

In my last report a table was given showing that 117,600 acres of land were under cultivation in Utah in 1889, and that a large number of acres could be brought under cultivation if new canals were built. The question of irrigation in the arid region is now receiving attention from Congress. It is now very plain that unless some artificial methods be employed the limit of cultivation will soon be reached. The water-supply in these arid regions is derived from the rivers which have their source in the heart of the great mountain ranges. They are fed by the

melting snows and find their way to the valleys below through deep cañons. The water is diverted from these cañon streams at or near the mouth of the cañon by means of canals, and spread over the land.

Until the climate changes no other supply of water can be depended upon for, owing to the limited water-surface, there is not sufficient solar evaporation to furnish the necessary rainfall.

It then becomes a matter of vital importance that something be done to store the great amount of water which pours down these cañons in the fall, winter, and spring. To do this successfully will require the construction of large engineering works on a scale and at a cost far beyond the financial ability of the settler.

I am of the opinion that any works which may be provided to properly husband the large amount of water which is now running to waste will have to be erected under the supervision and at the expense of the General Government.

It is probable that in Utah water is not now performing its full duty, but this will gradually be overcome by experience and better methods.

The experiments which are now being made elsewhere to obtain water from the depths are being carefully observed by the citizens of Utah. It is believed that the great rock basins which underlie the earth's surface hold vast bodies of water, and if the experiments are successful they may be repeated here.

The question of the water-supply is a momentous one to the West, and should receive intelligent and friendly consideration.

THE MINING INDUSTRY.

Statement showing value and amount of the principal mineral product of Utah from 1879 to 1889, both inclusive.

	Refined lead.		Unrefined lead.	
	Amount.	Value.	Amount.	Value.
	<i>Pounds.</i>		<i>Pounds.</i>	
1879	2,301,276	\$163,357.42	26,313,359	\$302,093.57
1880	2,692,498	144,624.00	28,657,643	641,441.75
1881	2,643,373	145,455.81	38,222,185	955,554.62
1882	3,213,798	410,690.00	52,249,850	1,361,096.00
1883	3,250,347	161,827.00	63,431,064	1,583,792.00
1884	4,840,987	169,434.34	50,023,893	980,418.12
1885			54,318,776	1,232,176.45
1886	208,800	9,667.44	48,456,280	1,405,291.54
1887	2,500,000	111,750.00	45,678,061	1,196,782.77
1888			44,567,157	1,203,313.23
1889	2,350,540	89,682.53	50,421,730	1,378,584.13
Total	20,192,619	1,346,409.33	514,443,775	12,522,499.19

	Silver.		Gold.		Copper.	
	Amount.	Value.	Amount.	Value.	Amount.	Value.
	<i>Ounces.</i>		<i>Ounces.</i>		<i>Pounds.</i>	
1879	3,732,247	84,106,351.70	15,732	\$298,908.00		
1880	3,663,183	4,029,561.50	8,020	100,400.00		
1881	4,358,345	5,503,762.95	6,982	132,640.00		
1882	5,425,444	6,714,874.00	9,669	180,780.00	608,666	873,735.00
1883	4,531,763	4,094,039.00	6,901	130,820.00		
1884	5,000,498	6,123,047.04	5,530	110,000.00	63,372	6,337.20
1885	5,972,689	6,211,596.56	8,903	178,060.00		
1886	5,918,842	5,860,837.24	10,577	211,540.00	2,407,550	144,453.00
1887	6,161,737	5,076,884.80	11,887	227,740.00	2,401,820	124,506.00
1888	6,178,856	5,787,527.51	13,886	277,720.00	2,880,816	228,681.00
1889	7,147,651	6,656,254.65	24,975	499,500.00	2,000,792	206,070.20
Total	59,370,744	61,355,876.94	122,022	2,434,708.00	10,513,730	845,821.00

The mining industry, like the agricultural, is always producing, but only after hard and unremitting toil on the sides and in the depths of almost inaccessible mountains. Since the year 1878, calculating from the most reliable data I can obtain, the yield of gold, silver, lead, and copper, as shown in the above table, has amounted to \$78,495,045.46. The yield in 1878 was \$5,100,912.69; in 1889, \$8,830,080.50, an increase of over 73 per cent. in eleven years. A large proportion of this amount, at least 60 per cent., has been expended for labor and supplies, thus affording a home market for surplus labor and products. The mining industry has been to a very large extent the basis of all the real prosperity which has come to the Territory. Commencing with the discovery of gold in California, which caused a ceaseless tide of emigration to flow through the valley of Utah, where thousands of dollars were spent for supplies to last them on their journey to the coast, down to the present time, this industry has been constantly adding to the material prosperity of the Territory. During the past year the miners have been very successful. Many important discoveries have been made in different mining camps. The action of Congress in passing the silver bill and the anticipated legislation imposing a tariff on lead ores imported from other countries has had a stimulating and beneficial effect, and it is probable the West is about to experience a revival of the mining industry on an extensive scale.

* * * * *

THE RAILROAD SYSTEM.

The railroad system of Utah is herewith given:

Road.	From.	To—	Miles of line.	
			Gauge, 4 feet 8½ inches.	Gauge, 3 feet.
Union Pacific—				
Main line in Utah	Ogden	Wyoming line	73	
.....	Ogden	Frisco	280	
Salt Lake and Western	Lehi City	Eureka	62	
Echo and Park City	Echo	Park City	31	
Utah and Nevada	Salt Lake	Terminus .....	.....	57
Utah and Northern	Ogden	Idaho line .....	.....	76
San Pete Valley .....	.....	.....	.....	34
Total Union Pacific .....	.....	.....	441	147
Denver and Rio Grande Western—				
Main Line in Utah	Colorado Line	Ogden	310.1	
Bingham Branch	Salt Lake	Bingham	16.3	
Little Cottonwood	Bingham Junction	Alta	18.2	
Pleasant Valley	Pleasant Valley Junction	Coal Mines	17.8	
Coal Mines .....	.....	.....	6.1	
Total Denver and Rio Grande Western .....	.....	.....	368	
Central Pacific in Utah				
.....	Ogden	Nevada Line	157	
Utah Central	Salt Lake	Fort Douglas .....	.....	6
	Salt Lake	Park City .....	.....	31
	Salt Lake	Mill Creek .....	.....	3
Grand total .....	.....	.....	966	187

The line from Ogden to the Idaho line is now being changed to broad gauge. The work will be completed about November 1, 1890. The line from Salt Lake City to Frisco is being extended to Pioche, Nev., about 100 miles.

The street-railroad system.

	No. miles run by electricity.	No. miles run by horses.	No. miles run by steam motors.	Total.
Salt Lake City*	24	6	.....	30
Ogden! .....	.....	9	.....	13
Provo .....	.....	.....	5	5
Total	24	10	14	48

* About 10 miles more of railway to be run by electricity are now being built. Transfer lines are also being constructed to different points outside of the city.

! Arrangements are about being made to change the larger part of the service to electric service. A motor line 8 miles in length running north from the city line to the hot springs is nearly completed.

THE POLITICAL SITUATION.

In my last report it was stated that at the municipal election held in the city of Ogden, in February, 1889, the Liberal party (non-Mormon) carried the city by 433 majority, and that at the election for members of the legislative assembly held in August, 1889, the Liberals again carried Ogden, and also carried Salt Lake City by 41 majority. The opinion was also expressed that at the municipal election to be held in Salt Lake City, in February, 1890, the Liberal party would carry the city. The election was held, and after one of the most exciting contests in the history of the Territory, which awakened national interest, the Liberals were victorious by 807 majority.

This was the first time in the history of the city that it passed from under Mormon control. The two most important cities in the Territory in point of population and wealth, and educational and commercial interests are now controlled and governed by the non-Mormons. This result has made a deep and lasting impression upon the political situation, and will exercise a strong influence upon the political future of the Territory. Much will depend upon the manner in which the Liberal party will administer the affairs of these cities. If they are wisely managed it will strengthen the party in the other portions of the Territory. At the school election for trustees held in the Territory in July last the non-Mormons elected a majority in Salt Lake and Ogden cities.

At the general election held in the Territory on the first Monday of August last for county officers, the People's party carried twenty-one and the Liberal party four counties by the following majorities, giving in each county the highest majority received by any one candidate:

	People's party.	Liberal party.		People's party.	Liberal party.
Beaver*	269	.....	Salt Lake .....	.....	117
Box Elder	263	.....	San Joaquin	24	.....
Cache*	904	.....	San Pete*	1,000	.....
Davis*	377	.....	Sewer*	512	.....
Emery*	303	.....	Summit .....	.....	536
Garfield*	156	.....	Tooele*	216	.....
Grand .....	.....	34	Utah!	199	.....
Iron!	179	.....	Utah*	1,005	.....
Juab!	146	.....	Wasatch!	235	.....
Kane!	124	.....	Washington!	243	.....
Millard!	262	.....	Weber .....	.....	209
Morgan!	207	.....		
Piute!	80	.....	Total	7,088	958
Rich	107	.....		

A Mormon majority in the Territory of 6,130.

* There was no active campaign by the Liberals, though opposing candidates were voted for.

! No opposition to the People's party.

! In this county the Liberal party is said to have 100 majority at this time.

The Liberal party was not thoroughly united in Salt Lake, Weber, and Juab counties because of divisions. It only elected six of nine candidates in Salt Lake County, losing three important offices; seven of ten candidates in Weber County, losing three important offices, and was defeated for every office in Juab County.

In Salt Lake County after the Liberal candidates were nominated a "workingmen's meeting" was called and an opposition ticket nominated composed of Mormons and Gentiles. The people's party subsequently indorsed the opposition ticket, with one exception.

I am informed that prominent leaders of the People's party made a secret arrangement with the promoters of the "workingmen's meeting," by which the political combination was effected, its object being to defeat the entire ticket of the Liberal party, if possible.

In the four counties carried by the Liberal party there was returned by the census of 1890, as shown elsewhere in this report, a population of 90,738; in the twenty-one counties carried by the Mormons, a population of 130,194. These figures show that while in the more thickly-settled counties the two political parties are about evenly divided, in the agricultural or more remote counties, the People's party is overwhelmingly in the majority; that in the Liberal counties the majority is 9 per cent., and in the People's party counties 52 per cent. of the total vote.

These facts emphasize the conclusion stated in my last report, that those who expressed the opinion that because of the victories in Ogden and Salt Lake cities, the Mormon rule was at an end in Utah, were in error; that it will be many years yet before the Gentiles will be in the majority. These conclusions I still adhere to and believe that time will prove them to be correct, unless Congress shall by appropriate legislation hasten the end.

THE MORMON PEOPLE.

Referring to the characteristics of the Mormon people in my last report I said:

The early Mormons were mainly native Americans and religious enthusiasts; that under a vigorous system of proselyting they had been largely recruited from all parts of the world; that either by chance or from policy these recruits had been gathered from the parts of the country where the average rate of intelligence is the lowest; that for a long time the bulk of these converts have come from the lower classes of Great Britain and Scandinavian countries; that they were picked up by a process of "natural selection;" that the doctrine as expounded by the missionary fits the mental condition of the convert; that as a rule they are law abiding, especially as far as the law is confirmed by the priesthood; that they have accepted the doctrine of plural marriage in all sincerity and as a radical and necessary part of their religion; that while the Mormon masses are too sincere to voluntarily make false pretenses they could be induced to accept and adopt any form of words, however contradictory, if advised to do so by the priesthood, for obedience to the priesthood is diligently inculcated as a first duty; that the orthodox Mormon in every political and business act puts the church first the country afterward, etc.

Referring to political and official Mormonism I said:

It was probably sincere, but that when it had any point to attain in behalf of Mormonism it deals in evasions, meaningless words or words of double meaning, hypocritical pretenses, false assertions, and every helpful evasion of word or act. Its attitude in regard to the status of the Mormon people in regard to polygamy is delusive to the last degree. It knows there has been no change on the subject, but it seeks to convey the impression there has been, etc.

I further said that it was a very poor tribute to pay to the Mormon people to say they have abandoned the doctrine of polygamy as a part of their faith. These views I still entertain. Nothing has transpired

during the past year which would lead me to change them. Statements have been made by prominent church leaders that the church does not sanction violations of law. Two years ago the president of the Salt Lake stake before a United States commissioner, in his examination in proceedings by the receiver to reach church property, in the suit of the United States against the church, and other parties, testified that since the death of John Taylor (the former head of the church) the present head of the church had refused to grant permission to persons desiring to enter polygamy. Since then the present head of the church (Wilford Woodruff) has stated in a private conversation that polygamous marriages are not now allowed to take place. When his attention was called to a notorious case which had been discovered in the first district court, he disclaimed any knowledge of the fact. In proceedings before an examiner appointed by the Supreme Court to investigate the accounts and proceedings of the receiver of the Mormon church property escheated under the provisions of the Edmunds Tucker law, a prominent Mormon testified that the church does not now sanction polygamous marriages. This is the only evidence which has been produced, or which has been offered, that the church does not now sanction violations of the law prohibiting polygamy.

The testimony of the two church officials, unsatisfactory as it is, is subject to the suspicion that it was colored by a desire to show that church property is not now used for unlawful purposes. The statement of the head of the church is answered by his statement that he knew nothing of the polygamous case developed in the first district court. But admitting the statements and testimony to be literally true, it does not prove that the church has met the public sentiment of the nation as expressed in its laws, and has abandoned polygamy. Nor does it prove what is more essential to know—that the church is loyal to the law. In recent years important gatherings have been held under the auspices of the Mormon church, and resolutions have been adopted by which they have vigorously declared their intention to remain true to the old faith, with all its teachings and practices. These have gone to the world with the sanction and approval of the leaders and the great body of the people. Are these solemn declarations to be brushed aside by the declarations of men who are interested in the determination of a legal proceeding, or by the unofficial, unsupported statements of the head of the church, made in a private conversation, or by statements which are made in language intended to convey a definite meaning to others, but under mental reservations and careful wording explainable so as to mean nothing? The non-Mormons believe that polygamous marriages are being entered into, and that the effective enforcement of the law prohibiting them has driven the church to more secret methods.

Under its system of government the church has but one way of defining its position, and that is by a public declaration either from the head of the church addressed to the people or by the action of the people in conference assembled. No such declaration has been made nor action taken, and probably never will be. There is no reason to believe that any earthly power can extort from the church any such declaration.

It may be truthfully said that the church has determined that if polygamy is to be uprooted the Government must perform the task, as it will never do on its part any act that will indicate an abandonment of polygamy.

The claim is also made that the church does not in any way influence political action, and any statement to the contrary is declared to be a

falsehood. If, in order to prove that it does so interfere, it is necessary to show that specific orders emanate from the church office directing the people in their political action, then the statement may be successfully denied. But there are many ways in which the political action of a people may be influenced. When a people during a long period of years have been taught from the pulpit, in official organs, by pretended revelations and otherwise, that the Lord has bestowed upon them certain leaders, and upon these leaders His priesthood, with power and authority to do His work upon the earth, and that they must obey these leaders in all things, temporal and spiritual, and, as a result of such teaching, the entire body of the people act in unison in all matters, it may not be necessary to issue a specific order in each case directing the people how to act. This is the condition of affairs in the Mormon community to-day. From the time of Joseph Smith down to the present time the burden of the church teachings has been unity. A Mormon leader rarely rises to speak without impressing upon the people the importance of unity. The result is no orthodox Mormon entertains the idea of acting for himself. He may think for himself, but his thoughts never crystallize into independent action. When they do he leaves the church. The orthodox Mormons believe they are discharging a religious duty when they obey their leaders and act in unison.

People outside of Utah may wonder that such a condition of affairs exists in this land, and may also wonder that the Mormons have not passed this age of faith and enthusiasm (through which it is said all religions must pass) and reached the age of more critical examination and inquiry. But this may be explained by the fact that for many years they were isolated in a territory distant from more civilized communities. Since the Territory has been better opened and more easily accessible they have shunned as far as possible outside associations and influences. They are constantly advised to beware and avoid associations with the wicked world; informed they are the chosen people of God, and that they must consecrate themselves to his service; and that in the fullness of time all nations and peoples will accept their doctrines and look to them as the great light shining upon the darkness of all nations of the earth. The mental energies of the people have all turned to religious subjects, and their reading, instruction and literature have been largely confined to the Bible, Testament, and Mormon publications, and their enthusiasm recruited by the accessions of new converts. These teachings and influences have cemented them together, and they obey their leaders with enthusiasm and without regret.

Again, there are certain fundamental ideas which control Utah Mormonism in its public relations and lead to the views which characterize it, a statement of which may explain more fully their complete devotion to the teachings of their leaders. The Mormon people are sedulously taught that their mission is to convert and reform the people of the whole world; that everything which comes to them is directly from the Lord. If they attain success, either in a religious, political, or business way, or if those whom they choose to term their enemies are unfortunate or discomfited in any way, it is the work of the Lord. If misfortune overtakes them or if their political enemies are successful the Lord is disciplining them or is punishing them for some disobedience or lack of faith and unity and that in the end it will prove a blessing.

They are taught that everything is according to prophesy, whether it be good or an apparent infliction. This optimism has been carried so far that it has practically become fatalism. The will of the Lord

may be revealed to any member, but the priesthood is the only authorized medium to reveal and declare His will, and obedience to the priesthood is practically obedience to the Lord.

It is useless to point out that their prophecies have failed; that the inimical world still exists unsubdued and apparently enjoying a fair measure of success; that their political fortunes are waning, and that their leaders are influenced in worldly affairs by the same motives that govern others, and are not always models of perfection. When good or evil come alike from the Lord the logic of events has no place or persuasive force, and it is useless to suggest to them the doubt that Mormonism will ever subdue the world. They pretend to think that the Lord is lying in wait for a proper time to punish the enemies of Mormonism. In one respect their optimism fails and their illogical conduct is strikingly apparent. While they assert that their political enemies are merely the Lord's instruments for their discipline or chastisement, they speak of them and criticise their motives with the scant courtesy they would give the emissaries of the evil one. Their acts and laws are not only charged to be unconstitutional and wicked, but their officials and their supporters are charged with malice and a desire to rob the Lord's people of their property and political rights.

They are so accustomed to judge of the constitutionality of laws and the justice of public measures that they do not fail to censure the means the Lord provides for their discipline and which are to contribute in the end to their success, and it must be a source of continual regret to them that He fails to employ constitutional means and methods to accomplish His purpose. The discipline is deserved, but they object to His discretion in the manner of administering it.

The people are also taught to be charitable in all things, something which these leaders do not always practice for themselves. They claim the right to act upon their convictions and denounce others who exercise the same right, and profess a superior Christian character, yet it is a matter of common occurrence for one of these leaders, claiming to hold the keys to heaven and earth, to go around using his religious offices to further the secular concerns of life. The laymen of the church are far superior to their leaders in point of sincerity and religious devotion. They are the props which uphold this fabric of superstition and ignorance. They labor for others. While their leaders are generally well to do, have comfortable homes, and see the pleasant side of life, they are doomed to a life-time of toil, and when the close of life comes they have practically nothing to leave to their families.

It will now be seen why the Mormon people are the willing servants of their religious masters and why the civilization of the age and contact with modern influences and associations have not worked the change which many have hoped for. It is because Mormonism involves slavery of the mind and the subjecting of the energies of the people, in a physical, moral, and religious sense, to the control of men whose motives are too often controlled by ambition and love of power.

Of course there are some who are groping their way out of the atmosphere of bigotry and darkness. There is no doubt but that the number of those who question the doctrine of blind submission to priestly authority and claim the right to criticise and exercise reason is yearly increasing. This is especially so in the districts which have the largest commercial relations and where there is a more extensive contact with those of other sects. The urgent demand of their leaders for unity and obedience is sufficient proof if no other proof existed. Recently a public speaker declared it was useless to attempt to conceal

that dissensions existed, and the people were warned that, unless they remained united and obedient, Mormonism was doomed. There is no reason to believe that dissensions which arise from the exercise of private judgment can ever be healed, for the cause which creates them can not be reached or removed without a retrogression to the stagnant mental condition of blind obedience, which is not likely to occur.

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I am, sir, very respectfully,

ARTHUR L. THOMAS,
Governor.

HON. JOHN W. NOBLE,
Secretary of the Interior, Washington, D. C.

REPORT OF THE GOVERNOR OF WYOMING.

EXECUTIVE DEPARTMENT,
Cheyenne, September 25, 1890.

Sir: In compliance with your request of July 28, I have the honor to submit herewith my annual report.

The last report from this office was made October 15, 1889, and covered generally all matters of interest to that date. It was a somewhat extended and exhaustive work, covering about one hundred and fifty pages and containing a map of Wyoming. A large number of these reports were printed, and this office can furnish copies to interested applicants in addition to the supply the Interior Department may have for this purpose. As nearly all the material used in 1889 is applicable now, I shall abbreviate the present work, making it supplemental to that of 1889.

Early in the present Congress Wyoming presented her claims for Statehood and asked for admission under the constitution prepared by a convention assembled for that purpose in September, 1889, and adopted by the people at an election held November 5 following. The bill for admission passed the House of Representatives March 27, 1890, passed the Senate June 27, and received the President's signature July 10.

In obedience to the constitution and bill of admission, the governor issued his proclamation July 15, calling for an election to be held September 11, 1890, to elect State, legislative, county, and precinct officers. This election has been held, and although the official canvass is not yet made, enough is known of the result to authorize the statement that the new State elected all the Republican nominees for State officers, and the member of Congress by an average majority of about 2,000 votes, and elected 40 out of 49 members of the legislature. The State officers elect will, under the constitution, assume their duties some time between October 11 and November 12; and a special session of the legislature will be convened between November 10 and December 12.

POPULATION.

According to figures in the office of the Wyoming Census Enumerator the official census, taken the present year, shows a population, in round numbers, exclusive of Indians, of 63,000. The first census of Wyoming Territory, taken in 1870, showed a population of 9,118 and

in 1880, 20,789. It is probable the census does not give nearly the entire population. For reasons well understood by the inhabitants of this country, it would be a very hard matter to record our population in the time allowed and with the means afforded. As remarked in 1889:

Wyoming is nearly 50 per cent. larger than the entire six New England States. It is in part mountainous and undeveloped, with scant railroad, stage, and post facilities, and many people living in remote districts. Census taking by the Government does not provide sufficient compensation to insure perfect work in such a field, and the taking of a full and complete census has been, and will be for some years exceedingly difficult.

The population is largely American, very generally of young and medium age and of high character in intelligence and morals. The mines employ a few thousand alien population, including perhaps 500 Chinese. The more thickly populated districts are in the southern portion of the State, along the line of the Union Pacific Railway, but the increase the past year has been greatest in the northeastern portion.

TAXABLE PROPERTY.

It is believed the assessed valuation for tax purposes in Wyoming does not exceed one-third the actual valuation; but as a fairly uniform assessment is represented in the values from year to year, a basis of comparison is made. In 1870 the total assessed valuation of property was \$6,924,357; in 1880 the valuation was \$11,857,344, and in 1890 the valuation is \$30,665,499.11. The law for collecting Territorial and municipal revenue provides that there shall be levied on the taxable real and personal property each year the following taxes:

For State revenue there shall be levied annually a tax not to exceed 4 mills on the dollar of the assessed valuation of the property in the State, except for the support of State, educational, and charitable institutions, the payment of the State debt and the interest thereon.

For county revenue there shall be levied annually a tax not to exceed 12 mills on the dollar for all purposes, including general school tax, exclusive of State revenue except for the payment of its public debt and the interest thereon. An additional tax of \$2 for each person between the ages of twenty-one and fifty years, inclusive, shall be annually levied for county school purposes.

No incorporated city or town shall levy a tax to exceed 8 mills on the dollar in any one year, except for the payment of its public debt and the interest thereon.

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SETTLEMENT OF LANDS.

The total number of acres of land in Wyoming is 62,645,120. Of this nearly 48,000,000 acres have been surveyed, and over 15,000,000 yet remain unsurveyed. More than three-fourths of the lands of Wyoming are yet open for settlement under homestead and other United States land laws, and the field is yet rich for the emigrant desiring new country and early privileges in the selection of lands. United States land officers are located at Cheyenne, Laramie County; Sandance, in Crook County; Douglas, in Converse County; Buffalo, in Johnson County; Lander, in Fremont County, and Evanston, in Uinta County.

It would much benefit Wyoming if Congress would adopt a more liberal policy in the matter of public surveys, and I beg to repeat my observations made a year ago upon this point.

By the terms of the appropriation bills of late years no surveys were authorized except of agricultural lands occupied by settlers. As the surrounding lands were not classed as agricultural, no contracts could be made for the survey of many of these

agricultural districts, because the compensation was not sufficient to pay for their segregation. The effect of this is, that there are many settlers who have been living upon unsurveyed lands for many years, improving their farms and raising crops. One of the finest agricultural exhibits displayed at our last Territorial fair was grown upon unsurveyed lands. The inability of a settler to obtain a legal right to the land selected by him for a home works a three-fold injury; first, to the Government, which receives no pay for the land; next, to the county and Territory, which derives no revenue from it; and lastly, to the settler who can obtain no title to the land, and is hazarding his improvements which are of no value to him in a commercial sense, as he can neither sell nor mortgage them. Moreover, there are large tracts of unsurveyed land in this Territory which are valuable for other purposes than agriculture. There are immense oil fields and coal beds and vast forests of valuable timber yet unsurveyed. In the present unknown condition it is impossible to protect the forests against the depredations of unscrupulous men, and the development of the coal and oil lands is retarded by the impossibility of surveying them under the present restrictions.

COMMERCE AND THE PROGRESS OF RAILROAD ENTERPRISES.

Wyoming is without navigable waters, and therefore its commerce must depend upon railroads. Some six hundred streams of water, large and small, are located within its borders, and although none are large enough for navigation, they all furnish practical grades for railroad building. The Union Pacific Railway extends entirely across the southern portion, the Oregon Short Line across the northwest; the Denver Pacific and the Colorado Central come in at Cheyenne; the Laramie, North Park and Pacific comes in at Laramie from the south to the Union Pacific; and the Cheyenne and Northern extends northward from the Union Pacific at Cheyenne. The Cheyenne and Northern is completed 125 miles, and the iron is now being laid on an extension of nearly 50 miles, which will connect it with the Wyoming Central Railway. The Wyoming Central (Northwestern) extends from the eastern line of Wyoming westerly throughout the central portion to Casper, some 150 miles. The Cheyenne and Burlington has about 30 miles extending from Cheyenne east; and the Burlington and Missouri, through its Wyoming branch, has a line extending into the northeast, in Weston County, and is now pushing on westward with the evident intention of crossing through Johnson and Sheridan counties to Montana. Valuable coal fields, rich in coking coal, have been tapped by this line. A connection is contemplated from Alliance, Nebr., southwest to Cheyenne, Wyo. The Pacific Short Line (or Wyoming Eastern) is employing a large number of engineers through the Territory, and its line is located entirely across the central portion from east to west. There are a dozen lesser railroad lines and branches contemplated, and work is being done upon some of them. Wyoming has about 1,000 miles of railroad already finished.

AGRICULTURE.

Increased development is noticed in agricultural pursuits, and new agricultural districts are constantly being brought to notice. The success which has attended irrigation farming in the arid regions of the United States and its growing importance has attracted much attention, as it has been shown that the greatest results in individual size and in general yield of crops grown are reached by the artificial application of water. Wyoming has a large number of reliable streams, and great development in irrigation is possible and probable. In many places, especially in northern Wyoming, much successful farming is done without irrigation.

STOCK-RAISING.

Stock-raising is the oldest industry in Wyoming, and a large amount of capital is invested in that business. There are fewer large herds and more smaller ones than formerly. The pasturage of Wyoming continues to be of the very best known, and it is believed that the live stock grown here will increase in numbers with agriculture rather than decrease, as was formerly feared when the open range system of raising cattle was the only one pursued. As water is taken out for irrigation much more hay and other food is grown, which increases the total food product.

The number of sheep and horses has increased very considerably during the last year, while the number of cattle has probably not increased nor materially decreased.

The herds and flocks are continually growing better in grade, weight, and quality; and the law is rigidly enforced for the prevention and extinguishment of diseases. Under our laws a competent veterinarian is provided for. No fatal contagious diseases exist within our lines at the present time.

MINING.

The Territorial geologist, provided for by law, is in the field examining new discoveries and reporting upon the various mining industries of Wyoming. Without doubt mining presents the greatest possibilities of any of the various resources of our commonwealth. The area underlaid with coal exceeds 30,000 square miles, and coal mines are being rapidly developed and the output greatly increased. During the last year many new openings have been made, and at least a thousand more men are employed in taking out this product than were employed one year ago.

The oil region is extensive, and oil will be one of the principal factors in the development of the State. A number of flowing wells, now plugged, only await better transportation facilities by either railway or pipe lines.

The Territory has had comprehensive mining laws. An official inspector of coal mines is constantly engaged. The laws are generally complied with, and, as a result, there have been no serious complaints on the part of employers or those employed in the coal mines. No strikes or disturbances of any magnitude, arising out of disagreements of employers and employes have occurred for some years. Accidents, resulting in death or serious injuries to the miners, are very rare.

Wyoming has the precious minerals, gold and silver, inexhaustible quantities of coal, petroleum, iron and soda; also copper, lead, tin, asbestos, mica, magnesium, sulphur, graphite, kaolin, fire-clay, glass sand, building stone, including granite, marble, slate, sandstone, limestone, etc.

The geologist will make his official report on the 30th of October, and a large number of printed copies will be at the disposal of those who may wish definite information upon Wyoming minerals.

FORESTS AND THE PRODUCTION OF LUMBER.

Wyoming has perhaps 7,000,000 acres of heavily timbered lands, and 7,000,000 or 8,000,000 acres more of sparsely covered lands. The forests are mainly confined to mountain ranges. Some are very dense and heavy. No lumber of consequence is manufactured for outside con-

sumption and very considerable eastern and western lumber is brought in. How to best protect the forests and yet provide for the wants of our citizens and for future development is a knotty problem. I repeat my observations of a year ago:

The United States laws prohibiting the manufacture of lumber from forests on the public domain, except for the use of actual settlers, are not calculated to promote the growth of this important industry. It is no doubt a fact that the protection afforded by mill owners to forests from destruction by fire is greater than the amount of timber which they annually consume in manufacturing lumber. Legislation providing for the leasing of timber lands under certain restrictions would, in my opinion, provide a remedy for many of the existing evils that are now complained of.

Fire is the great destroyer of the forests, and the timber cut and used for all purposes does not reach 5 per cent. of the total amount consumed by forest fires. The use of timber by settlers, mill-men, and others under proper regulations would in a great measure prevent the spread of the fires which every year devastate such vast areas.

LABOR SUPPLY.

There is in Wyoming a constant demand for skilled mechanics and for women for house service—cooking, second girls' work, etc. In nearly all the other lines of labor the supply is about equal to the demand.

Mechanics receive from \$2.50 to \$6 per day; laborers, \$1.50 to \$2.50; men for handling cattle, horses and sheep, \$20 to \$35 a month with board; farm hands about the same; house servants, \$15 to \$30 and board.

Wages are higher than in the Eastern and Middle States and the cost of living is also higher, but the percentage of wages is greater than the extra percentage in cost of living, and the laborer has a wider margin between the actual necessary expenses and what is earned than in Eastern States.

INDIANS.

The only Indian reservation within Wyoming is the Shoshone, comprising over 1,500,000 acres in Fremont County. A large number of Shoshones and Arapahoes are resident there, who still retain their tribal relations. A military post is in close proximity and the Indians give but little trouble to the Government. Complaints are frequently made that the Indians are off their reservation shooting game for their skins, and in some cases depredating upon domestic live-stock. There is, however, probably as little trouble from this agency as from any other.

CONCLUSION.

Should this report fall into the hands of any who desire more detailed information of Wyoming, I will forward, upon application, copy of the report of 1889, with descriptive matter concerning Wyoming not herein contained.

I am, sir, very respectfully, your obedient servant,

FRANCIS E. WARREN,
Governor.

Hon. JOHN W. NOBLE,
Secretary of the Interior.

REPORT OF THE COMMISSIONER OF INDIAN AFFAIRS.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, September 5, 1890.

THE SECRETARY OF THE INTERIOR:

SIR: I have the honor to submit the fifty-ninth annual report of the Commissioner of Indian Affairs.

IN GENERAL.

DUTIES OF THE COMMISSIONER.

The law prescribes that the Commissioner "shall, under the direction of the Secretary of the Interior, and agreeably to such regulations as the President may prescribe, have the management of all Indian affairs, and of all matters arising out of Indian relations." He is charged with the annual disbursement of more than \$7,000,000 and with the purchase and distribution of great quantities of subsistence, clothing, agricultural, medical, and other supplies. He gives instructions to more than sixty agents, supervises their work, examines their accounts, decides perplexing questions arising constantly in the course of administration of agency affairs, and through them oversees in detail the various lines of civilization inaugurated among the tribes, farming, stock-raising, building of houses, Indian police and courts, social and sanitary regulations, etc. He determines upon the appointment and removal of over twenty-five hundred agency and school employes, and appoints traders and physicians. Licensed trade among Indians is under his exclusive control.

He considers and determines all questions of law arising in reference to Indian lands; the legal status of Indians with reference to each other and to white people; the conflicts between local or State laws and tribal customs, and between State and Federal laws; also questions of citizenship, guardianship, crimes, misdemeanors; the prosecution of persons for the sale of whisky to Indians; taxation; water rights; right of way of railroads; cattle grazing; conveyances of land; contracts between Indians and whites; sales of timber on Indian reservations; allotment of land, etc. Many of these questions, especially those relating to lands, are of great intricacy, involving interpretations of treaties and laws as far back as colonial times.

He is charged with the duty of organizing a plan of education, with all which that implies; the erecting of school houses, appointing of teachers, and the keeping of a watchful oversight over all Indian school matters.

Bills in Congress relating to Indian affairs are usually referred to the Indian Bureau for information and report, and before an act is signed by the President it is generally referred to the Commissioner for report as to whether there is any reason why it should not receive Executive approval. Original bills and reports are also prepared by the Indian Office for transmission to Congress.

Under the act of March 3, 1885, the Commissioner examines and reports to the Secretary of the Interior on all depredation claims, amounting to many millions of dollars, which have been filed in the Bureau during the last forty years.

The foregoing gives an approximate idea of the responsible duties and the varied character of the work performed under his direction and

supervision. The duties and labors of the office are constantly increasing and becoming more arduous and difficult as the progress of Indian civilization makes it necessary to deal with the race, not in their collective capacity as tribes and bands, but with the individuals who are being led to the holding of separate estates, thus multiplying many fold the interests to be considered, developed, and protected.

DIFFICULTIES OF THE SITUATION.

I have cited these duties somewhat in detail, because I desire to set forth some of the difficulties which seriously embarrass and limit their satisfactory discharge. The chief one is the lack of sufficient and proper help in the Bureau itself. The nature of the work requires clerical help of a high order. In addition to the force now employed there is needed a chief clerk, who shall be charged with a general oversight of all the correspondence, and who shall follow up important matters from their beginning until the final result is reached.

There should be a solicitor to whom difficult law questions can be referred, and whose special business it shall be to examine and report upon all claims for money presented by Indians. Such an officer might save to the Government thousands of dollars, and at the same time assist the Indians to obtain their just dues. This would obviate the apparent necessity of so many paid attorneys, employed by the Indians at large fees, to prosecute their claims before the office and before Congress.

There is urgently needed at once the following additional clerical help: One clerk of class 4, two of class 3, and three of class 2; also one medical expert, charged with an oversight of the sanitary condition of the Indians. Without sufficient help in the office it is simply impossible to have the work done as it should be. Those now employed are faithful, industrious, and generally competent, but the work is too much for them and must and does suffer. The Commissioner is painfully aware of this fact, but is powerless to help it.

The Indians, with whose welfare and civilization he is charged, are widely scattered, and the territory in what is known as Indian reservations embraces not less than 181,000 square miles. The Navajo Reservation is in extent almost an empire in itself—12,800 square miles. The means of communication between the Bureau and the agents are at best imperfect, and in some instances very unsatisfactory. It is impossible for the Commissioner to visit and inspect all the agencies, he can not always rely upon official reports, and it is often very difficult even for the agents to have a personal knowledge of the territory and the people over whom they are placed.

A great obstacle is found in the strange languages still used by most tribes. They communicate with their agents and with the Bureau through interpreters, who, in some instances, are entirely incompetent for an intelligent transaction of business. Further, the various tribes differ so essentially among themselves in languages, habits, and customs, as well as in environment, as to make it very hard to adapt to their varying necessities any policy which may be adopted.

The entire system of dealing with them is vicious, involving, as it does, the installing of agents, with semi-despotic power over ignorant, superstitious, and helpless subjects; the keeping of thousands of them on reservations practically as prisoners, isolated from civilized life and dominated by fear and force; the issue of rations and annuities, which

inevitably tends to breed pauperism; the disbursement of millions of dollars worth of supplies by contract, which invites fraud; the maintenance of a system of licensed trade, which stimulates cupidity and extortion, etc.

The small salaries paid to agents and physicians renders it very difficult to procure the services of thoroughly efficient and honest men who are contented to devote their entire energies to the good of the service without hope of other reward than their meager salaries. (See pages 699 and 700.)

The still all too prevalent public sentiment which looks upon Indians with contempt and regards them as the legitimate spoil of white men, has its influence in lowering the grade of this branch of the public service.

The white people who hang on the borders of the reservations, those who have allied themselves by marriage with the tribes, and even those who have from time to time been in Government employ, have, in many cases certainly, presented to the Indians a type of character and a practical philosophy of life on a par with, if not inferior, to their own.

The natural conservatism of the Indians, which leads them to cling with tenacity to their superstitious and inherited practices, adds to the difficulty of inducing them to abandon their own and accept the white man's ways.

A HOPEFUL OUTLOOK.

Notwithstanding all these hindrances, however, there has been for ten or more years real progress in the right direction, and the outlook for the future is encouraging. The following points are especially worthy of consideration, and need to be repeated and emphasized until they are fully recognized by both whites and Indians:

It has become the settled policy of the Government to break up reservations, destroy tribal relations, settle Indians upon their own homesteads, incorporate them into the national life, and deal with them not as nations or tribes or bands, but as individual citizens. The American Indian is to become the Indian American. How far this process has advanced during the past year will be shown under the head of the reduction of reservations and allotment of lands.

A public-school system is being rapidly provided, whereby every accessible Indian boy and girl of school age is to be afforded an opportunity of acquiring the rudiments of an English education and the elements of an honorable calling. What progress has been made in this direction during the last year is discussed under the general topic of education.

The Indians themselves are coming to understand the present policy of the Government and are showing an increasing readiness and even desire to adjust themselves to it. During the past year I have had personal interviews with prominent chiefs and representative Indians from Wisconsin, North and South Dakota, Oregon, Arizona, New Mexico, Oklahoma, and Indian Territory, and I have been much gratified with their intelligent apprehension of the situation and with the willingness exhibited, as a general thing, to accept lands in severalty with individual citizenship. Almost without exception they have pleaded with me for more and better schools.

Another fact of significance is the growing recognition on the part of Western people that the Indians of their respective States and Territories are to remain permanently and become absorbed into the population as citizens. While demanding the application of the prin-

ciple of "home rule" in the selection of agents and other employés from the State or Territory in which the Indians are located, I think they also recognize the obligations which they thereby assume to recommend only suitable persons for appointment. If the Indians of South Dakota, for instance, are to remain forever within the limits of the State, either as a burden and a menace, or as an intelligent, self-supporting, co-operative factor in State life, no others except the Indians themselves can have so deep an interest in their practical status as the people by whom they are surrounded.

There is also a growing popular recognition of the fact that it is the duty of the Government, and of the several States where they are located, to make ample provision for the secular and industrial education of the rising generation, leaving the churches free to prosecute with renewed vigor their legitimate work of establishing and maintaining religious missions. By this harmonious and yet separate activity of the Government and the churches all of the Indians will eventually be brought into right relations with their white neighbors, and be prepared for the privileges and responsibilities of American Christian citizenship.

SUMMARY OF IMPROVEMENTS ATTEMPTED.

In addition to the ordinary routine work of the office, the points to which I have given special attention during the year have been the following:

The improvement of the personnel of the service.—Wherever it could be done without too great hardship I have endeavored to remove those who were immoral, incompetent, inefficient, or unfaithful. No one has been discharged on account of politics or religion, and in no single instance except for the improvement of the service. I have steadily refused to remove those who were performing their duties satisfactorily. In making appointments I have, so far as it lay in my power, endeavored to secure persons of good moral character, having special fitness for their work, and where mistakes have been made, I have not been slow to correct them. Allow me, in this connection, to recognize heartily the cordial support given to me in this matter by yourself and the President, and also the painstaking efforts you have both put forth in the selection of Presidential appointees.

The elevation of the schools.—A great deal of thought has been given to this subject, and the schools have been visited and inspected with a care and thoroughness hitherto unattempted. The work accomplished by superintendent Dorchester will appear in his report on page 246. Large and careful expenditures have been made in repairing and enlarging school-houses and providing them with proper equipments, and new ones have been erected where most urgently demanded. A new and carefully revised system of rules, including a course of study, has been drawn up and a series of text-books determined upon. A work of this kind is beset with many difficulties and necessarily proceeds slowly, but when once accomplished is enduring.

The development of industries.—Great improvements have been made at the Government schools in this important direction. Competent instruction is given to boys in blacksmithing, broom-making, carpentering, dairying, farming, fruit culture, harness-making, printing, tailoring, tinsmithing, shoe-making, stock-raising, wagon-making, and wheel-

wrighting; to girls, in all the ordinary duties of housekeeping. The work accomplished among the older Indians in teaching them the arts of agriculture are discussed under the head of Indian farming.

The improvement of the sanitary service.—There is a widely prevalent, but very mistaken, notion that the Indians, children of nature, are a healthy, rugged people. Nothing can be further from the truth. They are the sport of disease, are well-nigh helpless in their struggles against the elements, are almost wholly ignorant of the laws of health, are careless of their persons, are dominated by senseless superstitions, are the victims of the crudest kinds of quackery, and perish by hundreds during the prevalence of an epidemic. (See page 699.)

The modification of the ration system.—Heretofore Indians receiving rations have been required to go to the agencies to get them, thus involving a great waste of time and strength. The plan of issuing rations at substations, which is now being put into operation, is discussed more at length under the head of Indian farming, page 707.

The common method of issuing live beebes to the Indians is a relic of barbarism, cruel and filthy. Stringent orders have been issued for the correction of this great evil, and proper facilities for slaughtering are now being provided.

Inculcation of patriotism.—On all Government schools the American flag has been displayed, national holidays have been duly celebrated, the pupils are learning patriotic songs and recitations, and are taught to love the great nation of which they are a part, and to feel that the people of the United States are their friends and not their enemies.

Discouraging the Wild West Show business.—I have refused to grant any more licenses for Indians to leave the reservations or to enter into any other contracts with showmen. I have instituted proceedings against showmen and their bondsmen to compel the fulfillment of former contracts, which required them to treat their employes with humanity and justice.

EDUCATION.

In my supplemental report of last year I set forth quite in detail my views regarding Indian education. These views have met with most gratifying acceptance, and have awakened a great deal of interest among all classes of citizens. The plan there outlined has received the indorsement of Dr. W. T. Harris, United States Commissioner of Education, and of General John Eaton, ex-Commissioner of Education, and has been heartily approved by the National Educational Association, the American Institute of Instruction, the New York State Teachers' Association, and other leading educational bodies, besides receiving the warm commendation of distinguished educators and philanthropic organizations, like the Mohonk Conference, the Indian Rights Association, etc. After a year's practical work in carrying out the ideas there expressed, I see no reason to modify them in any essential particular.

TRAINING SCHOOLS.

Under the fostering care of the Government a series of training schools has grown up off reservations where, in addition to the ordinary English education, Indian pupils are trained to habits of industry.

TABLE I.—List of training schools with their location, date of opening, and capacity.

Name.	Location.	Date of opening.	Capacity.
Carlisle.....	Pennsylvania.....	1879	500
Salem.....	Oregon.....	1880	250
Genoa.....	Nebraska.....	1884	250
Haskell Institute.....	Lawrence, Kans.....	1884	450
Chillico.....	Oklahoma.....	1884	200
Grand Junction.....	Colorado.....	1886	60
Albuquerque.....	New Mexico.....	1886	225
Chiricah.....	Nevada.....	1890	150
Santa Fe.....	New Mexico.....	1890	125
Pierre.....	South Dakota.....	1890	90
Fort Totten.....	North Dakota.....	1890	250

TABLE 2.—Showing attendance, cost, etc., of training schools during fiscal year ended June 30, 1890.

Name of school.	Location.	Rate per annum.	Capacity.	Number of employees.	Enrollment.	Average attendance.	Cost to Government.
Albuquerque Training ..	Albuquerque, N. Mex.	\$175.00	225	28	222	164	27,224.36
Carlisle Training	Carlisle, Pa.	167.00	500	64	729	702	60,674.24
Chenawa Training.....	Near Salem, Oregon...	175.00	250	33	194	169	36,658.28
Chillico Training.....	Chillico, Oklahoma.....	175.00	200	27	196	154	27,693.21
Genoa Training.....	Genoa, Nebr.....	175.00	250	23	203	176	31,851.66
Grand Junction Training	Grand Junction, Colo.	175.00	60	9	48	36	9,428.12
Haskell Institute.....	Lawrence, Kans.....	175.00	450	54	460	417	75,961.62
Total.....			1,935	238	2,112	1,818	301,691.59

For the fiscal year ending June 30, 1891, Congress has made liberal appropriations for these schools which will help the Office to put them on a broad basis, and thoroughly equip them for their important work. With the improvements now being made they will be able next year to care for not less than thirty-three hundred students.

In estimating the work done several things should be carefully borne in mind: These institutions are not universities, nor colleges, nor academies nor high schools. In the best of them the work done is not above that of an ordinary grammar school, while in most it is of the primary or intermediate grade.

The pupils come to them for the most part ignorant of the English language, unaccustomed to study, impatient of restraint, and bringing with them many of the vices and degraded habits of camp life. From the very necessities of the case, the length of time which most of them have been kept in school has been very short. The time required for children in the public schools to complete a course of study embraced in the primary, intermediate, grammar, and high school is from fourteen to fifteen years. It has been heretofore commonly supposed that three years was long enough to educate an Indian and fit him to compete with his white neighbor, who has enjoyed so much greater advantages.

The work, embracing as it necessarily does, the supplanting of a foreign language by the English, the destruction of barbarous habits by the substitution of civilized manners, the displacement of heathenish superstitions by the inculcation of moral principles, the awakening of sluggish minds to intellectual activity by wise mental training and the impartation of useful knowledge, has been undertaken by these Indian teachers almost single-handed and alone, unaided by those potent factors outside of school which play so large a part in the education of our own children. (See page 693.)

It is a fact not to be forgotten in any discussion of popular education that the most important factors in the development of our American civilization have been in the colleges, universities, and professional schools. Without these there would have been no common schools. If the average of intelligence among the Indians is to be brought up to the level of that of the other peoples which compose our nation, and they are to be prepared to compete in life's struggles on an equal basis, provision must be made whereby those among them who are specially gifted with talent, ambition, and energy may procure a higher education than is offered to them in the reservation and training schools. Already a very considerable number have shown both the desire and ability to pursue higher studies. Several are now successfully teaching, or fitting themselves to teach, others are practicing medicine, some are preaching, and still others are preparing for the practice of law. The desire for these higher studies is steadily increasing and only needs a little fostering to be productive of the best results. A common school, industrial education for all, a liberal and professional education for the worthy few, with a fair field and free competition, is all that is asked for Indians as for others.

The outing system which brings Indian youth into intimate and vital relationship with civilized communities is now steadily developing and is productive of the most hopeful results. During the past year Carlisle has accommodated nearly eight hundred pupils, more than half of whom have had the inestimable advantage of living and working, for periods varying from a few weeks to several months, with Pennsylvania farmers and others, who have paid them a reasonable compensation. Their work has been very satisfactory, and the school has been unable to meet the demand made upon it for help. When the present plans for increasing its capacity are completed, not less than a thousand pupils can be cared for at this one institution, and so far as I can now see it will be entirely feasible to carry perhaps double this number. Every Indian boy or girl who secures a place to work at fair wages has become a producer, and is practically independent and self-supporting.

The superintendent of Haskell Institute writes me that he expects to be able, when the present plans for that school are completed, to care for one thousand students, and to provide homes for a large number of them among Kansas farmers. How far it will be possible to extend the outing system in connection with these training schools I am not prepared to say, but the system seems to have great possibilities, and its development shall receive my constant and careful attention.

These training schools, removed from reservations, offer to the pupils opportunities which can not by any possibility be afforded them in the reservation schools. The atmosphere about them is uplifting, they are surrounded by the object-lessons of civilization; they are entirely removed from the dreadful down-pull of the camp. If the entire rising generation could be taken at once and placed in such institutions, kept there long enough to be well educated, and then, if such as choose to do so were encouraged to seek homes among civilized people, there would be no Indian problem.

RETURNED STUDENTS.

It should be especially remembered that the oldest of these training schools, that at Carlisle, Pa., has been in existence only eleven years, and last year graduated its first class. Very few of the graduates have returned to their homes and none of them have as yet had any opportunity to show what they can do. The unfairness of some of the criticisms

upon returned students, who are inaccurately denominated "Carlisle graduates," or "graduates of the Carlisle University," is apparent. There has been no time in which to estimate from practical experience the influence which has been exerted upon these pupils. The time has not been too short, however, to show that, notwithstanding all the hindrances under which the work is carried forward, Indian children, under equally favorably conditions, are just as susceptible of education as any other class.

Relatively to the Indian population, a very small proportion of boys and girls have yet been brought under the influence of these schools. The few who have returned home have therefore found themselves in too many cases isolated by their dress and habits, out of sympathy with their surroundings, ostracized by their companions, and too frequently practically helpless. The remedy for this is two-fold. First, the universal education of the rising generation, so that there will be a common bond of sympathy and mutual helpfulness between them. Second, the encouragement of pupils who have finished the course of study in the training schools to seek for themselves homes and employment among civilized people.

Pupils in these schools should be taught that they must depend upon themselves and not expect to be furnished employment by the Government. Ample opportunities are afforded them for acquiring an education, with the expectation that they will prepare themselves to earn their own living. There is no necessity of their returning to the reservations, except as a matter of choice, for all who are intelligent, industrious, honest, and thoroughly capable can secure honorable and remunerative employment among civilized people, which they should be encouraged to seek. (See page 695.)

RESERVATION SCHOOLS.

Boarding schools.—The following is a list of the sixty-three Government boarding schools on reservations:

Arizona—Colorado River, Fort Mojave, Navajo, Keams Cañon, Pima, San Carlos; California—Fort Yuma; Idaho—Fort Hall, Fort Lapwai, Lemhi; Indian Territory—Quapaw, Seneca; Kansas—Kickapoo, Pottawatomie, Sac and Fox and Iowa; Minnesota—Leech Lake, Red Lake, White Earth; Montana—Blackfeet, Crow, Fort Peck; Nebraska—Omaha, Santee, Winnebago; Nevada—Pyramid Lake, Western Shoshone; New Mexico—Mescalero; North Dakota—Fort Stevenson, Standing Rock (2); Oklahoma—Absentee Shawnee, Arapaho, Cheyenne, Kaw, Kiowa, Osage, Otoe, Pawnee, Ponca, Sac and Fox, Wichita; Oregon—Grande Ronde, Klamath, Siletz, Sinemasho, Umatilla, Warm Springs, Yainax; South Dakota—Cheyenne River, Crow Creek, Lower Brulé, Pine Ridge, Sisseton, Yankton; Utah—Uintah; Washington—Chelalis, Neah Bay, Puyallup, Quinalt, S'Kokomish, Yakima; Wisconsin—Green Bay; Wyoming—Shoshone.

Concerning these schools it may be said: They have been for the most part poorly equipped. The buildings in many cases were small, cheap, inconvenient, often inadequately furnished, frequently very deficient in ventilation, heating, and water supply. Many had been grossly neglected and were sadly out of repair. During the past year an earnest effort has been made to improve them by repairs, additions, or new buildings, and by supplying water or heating facilities, as needed. There still remains much to be done, however.

* * * * *

INDIANS IN THE PUBLIC SCHOOLS.

Believing that the true purpose of the Government in its dealings with the Indians is to develop them into self-supporting, self-reliant, intelligent, and patriotic citizens, and believing that the public schools are the most effective means of Americanizing our foreign population, I am desirous of bringing the Indian school system into relation with that of the public schools. Not only so, but wherever possible I am placing Indian pupils in the public schools. Very few are thus far enjoying these advantages, but in a letter addressed to the superintendents of public instruction in the several States and Territories where there are Indians under the care of the National Government I have invited their co-operation, and have offered to contract with school districts for the tuition of Indian pupils at the rate of \$10 per quarter.

I think this will prove a very important feature of the work in hand, and confidently expect within a year to be able to report a great advance in this direction. Indian allottees can be provided with educational facilities for their children in no more satisfactory manner, and the tuition paid by the Government aids the school districts to maintain schools in sections of the country where lands in severalty have been taken by the Indians.

COMPULSORY EDUCATION.

My predecessors and many of the agents and superintendents of schools have strongly urged the importance and necessity of a law compelling the attendance of pupils at the schools. I am in favor of compelling every Indian child of suitable age and health, for whom accommodations are provided, to attend school ten months out of twelve. A general law, however, could not now be everywhere applied, for the simple reason that school accommodations are provided by the Government for less than half the children of school age. The question among many tribes is not so much one of filling the schools as it is of finding room for the pupils. With few exceptions every reservation school is crowded, and hundreds of children who are willing to go to school are prevented by want of proper accommodations.

Something in the way of compulsory attendance may be secured through the authority already vested in the agent under direction from this Office, whereby full and regular attendance at school is required upon forfeiture of rations, annuities, or other favors as the penalty for indifference or open opposition. It does not meet the case of the non-reservation schools, however. Under the law children can not be taken from the reservation except by permission of their parents, and although the non-reservation schools are generally better equipped than those at the agencies, at times great difficulty is experienced in inducing pupils and parents to consent to the transfer.

SCHOOL ATTENDANCE.

TABLE 3.—*Showing enrollment and average attendance at Indian schools for the fiscal years 1887, 1888, 1889, and 1890.*

Kind of school.	Enrolled.				Average attendance.			
	1887.	1888.	1889.	1890.	1887.	1888.	1889.	1890.
Government schools:								
Training and boarding.....	6,847	6,998	6,797	7,396	6,276	5,533	5,212	5,644
Day.....	3,115	3,175	2,863	2,963	1,896	1,929	1,744	1,780
Total.....	9,962	10,173	9,660	10,359	7,172	7,462	6,956	7,424
Contract schools:								
Boarding.....	2,763	3,234	4,038	4,186	2,258	2,694	3,213	3,384
Day.....	1,044	1,293	1,307	1,004	604	786	962	587
Industrial boarding, specially appropriated for.....	564	512	779	988	480	478	721	837
Total.....	4,371	5,039	6,124	6,178	3,342	3,958	4,896	4,808
Aggregate.....	14,333	15,212	15,784	16,537	10,514	11,420	11,852	*12,232

*The average attendance for 1890 is computed on the attendance during the entire year including summer vacations. The average attendance for the nine months from October 1 to June 30, was 12,462, a gain of 1,021 over the corresponding months of the preceding year.

The total enrollment during the year ended June 30, 1890, is 16,377, while the estimated school population (six to sixteen years of age), exclusive of the Indians of New York State and the Five Civilized Tribes, is 36,000.

Many reasons have combined to cause this comparatively small attendance, of which a few may be mentioned. Very inadequate provision has been made. In some cases, as among the Navajos for instance, where there is a school population of 3,600, with accommodations for only 150 pupils, or at San Carlos Agency, where the conditions are similar, I have no doubt that the attendance could be doubled in one year, simply by making provision for the children who can not go to school because there is no school for them to go to. In many places the Indians are impatient in their demands for the schools which the Government has failed to supply them, though in some cases they have been promised for years.

In many instances the facilities have not only been inadequate, but the school-houses have been unattractive and unhealthy and the children have been neglected or badly treated. Great improvements have been made during the year, and others are under way which will insure for next year a considerable increase in attendance.

In some cases the agents have taken little or no interest in the schools, or have been so occupied with other cares that they have done little or nothing to build them up or make them inviting, while in still others the small attendance is directly chargeable to their ignorance, neglect, or even secret opposition. Where this has seemed to be beyond improvement or remedy, I have not hesitated to suggest it to you as a sufficient cause for removal.

One great hindrance is the poor health so common among the Indian children. Disease is very prevalent, and during the last year the ravages of the grippe were very distressing. There were thousands of cases of it, and where it was not necessary actually to suspend the schools the number of pupils in attendance was very largely decreased. The Indians

as a whole suffer especially with pulmonary troubles, sore eyes, and diseases of the skin, and it must be conceded that these conditions offer one of the most serious obstacles to a regular, uniform school attendance.

Another hindrance is, very naturally, the failure of parents and children alike to appreciate the nature and importance of education. They can not see for themselves, and it is difficult to make them understand all it means for them. They either ignore the school entirely or expect it to accomplish wonders in a brief period. Three years they consider a very long time in which a boy or girl should not only fully master the English language, but acquire all the accumulated learning of the white man. Happily, a great change in this respect is taking place, and there is a growing desire among parents as well as among children that the education may be more complete.

If the Government will provide the means to establish and maintain schools in accordance with the system laid down in my supplemental report of last year, it is only a question of time—two or three years I think will suffice—when all Indian youth of school age and of suitable health can be put into school.

The following tables, taken from that report and brought down to date, show the number of Indian pupils who have been attending school since 1882 and the appropriations which have been made for Indian education since 1877.

TABLE 4.—*Showing Indian school attendance from 1882 to 1890, both inclusive.*

Year.	Boarding schools.		Day schools.		Totals.	
	Number.	Average attendance.	Number.	Average attendance.	Number.	Average attendance.
1882	71	2,755	54	1,311	125	4,066
1883	75	2,599	64	1,443	139	4,042
1884	86	4,358	76	1,757	162	6,115
1885	114	6,291	86	1,942	200	8,233
1886	115	7,260	99	2,370	214	9,630
1887	117	8,029	110	2,500	227	10,529
1888	126	8,795	107	2,715	233	11,510
1889	136	9,140	103	2,409	239	11,549
1890	140	9,805	106	2,267	246	12,072

TABLE 5.—*Annual appropriations made by the Government since the fiscal year 1877 for support of Indian schools.*

Year.	Appropriation.	Per cent. of increase.	Year.	Appropriation.	Per cent. of increase.
1877	\$20,000	.....	1885	\$592,800	47
1878	20,000	50	1886	1,100,000	19
1879	60,000	100	1887	1,211,415	10
1880	75,000	25	1888	1,179,616	*02.8
1881	75,000	.....	1889	1,548,015	34
1882	155,000	80	1890	1,364,565	61
1883	447,250	263	1891	1,842,779	35
1884	675,200	38			

* Decrease.

In this connection it is worth while to note the allowances made by the Government to other than Government schools for the education of Indians.

TABLE 6.—*Showing amounts set apart for various religious bodies for Indian education for each of the fiscal years 1886 to 1891, inclusive.*

	1886.	1887.	1888.	1889.	1890.	1891.
Roman Catholic	\$118,343	\$194,635	\$221,160	\$347,672	\$356,957	\$363,349
Presbyterian	32,905	37,910	50,500	41,825	47,650	44,850
Congregational	16,121	20,696	26,080	29,310	28,450	27,271
Martinsburgh, Pa.	5,400	10,410	7,500	Dropped.		
Alaska Training School		4,175	4,175			
Episcopal		1,800	3,600	18,700	24,876	29,010
Friends	1,900	27,845	14,460	23,383	23,383	24,743
Mennonite		3,340	2,500	3,125	4,375	4,375
Middletown, Cal.		1,523	Dropped.			
Unitarian		1,350	5,400	5,400	5,400	5,400
Lutheran, Wittenberg, Wis.			1,350	4,050	7,560	9,180
Methodist				2,725	9,940	6,700
Miss Howard				375	600	1,000
Appropriation for Lincoln Institution..	33,400	33,400	33,400	33,400	33,400	33,400
Appropriation for Hampton Institute..	20,040	30,040	20,040	21,040	20,040	20,040
Total	228,269	303,214	376,264	530,905	602,640	570,218

THE MEDICAL SERVICE.

The Government has assumed the medical oversight of the great body of Indians, excepting the five civilized tribes. The Indian "medicine" men are ignorant, superstitious, sometimes cruel, and resort to the most grotesque practices. The only rational medical treatment comes not from among themselves, but is that which is furnished by the Government physicians.

This very important branch of the service is without competent supervision. There is no professional head. The supervision of the medical service should require the entire time of a competent expert. Many of the men now serving as physicians are men of high personal character, of good professional attainment and experience, and are faithful in the performance of their duties; others I have been obliged to discharge for immorality, neglect of duty, incompetency, or unprofessional conduct, and especial care has been taken to fill their places with those who are trustworthy and competent.

With the hope of securing a more satisfactory order of things, I wish to point out some defects inherent to the plan now pursued in supplying the Indians with medical service.

Physicians are appointed without any examination. They are required to produce a diploma from some reputable medical school and to submit testimonials as to moral character and correct habits, and yet their appointments are not guarded with that care which the nature of the services required of them demands. No one should be appointed except upon an examination as to his health, his professional attainments, and his moral qualifications. In addition to his qualifications for general practice, his ability to give instruction on hygienic subjects to school pupils should be tested, and he should possess such scientific and practical knowledge as will prepare him to have an oversight of the entire sanitary conditions of a whole tribe. In short, he should be capable of being a health officer as well as a physician and surgeon.

The work of the physicians is without supervision. The average agent, inspector, and special agent has no expert knowledge of medical practice, and the Indians are ignorant and helpless to make complaint either of neglect or malpractice. The physician at an Indian agency,

far removed from civilization, having the care of a barbarous people beset with the formidable difficulties of his anomalous situation, having no professional associations and with no possibility of gaining either increase of income or reputation by devotion to duty, is under a very strong temptation to slight his work. Intelligent, faithful inspection by a medical expert, and official supervision of his labors, with a recognition of good service when performed, would necessarily secure better results than are now reached. The duties devolving upon the physician are very severe. He has the work of a surgeon and physician, with the sanitary oversight of people with whose language he is unfamiliar and who are ignorant, superstitious, and predisposed to a great variety of diseases. He must be his own apothecary; he usually has no hospital and no nurses, and his patients have few of the most ordinary comforts of home, and little, if any, intelligent care in the preparation of their food or the administering of prescribed medicine. He is alone and has to cope with accident and disease without consultation, with few books, and but few surgical instruments.

The salaries paid are very meager, as will be seen from the following table:

TABLE 7.—*Number of Physicians in the Indian service and salaries paid.*

No.	Official designation.	Salary.	No.	Official designation.	Salary.
1	Agency physician.....	\$1,300	4	Physician at schools.....	\$1,200
28	do.....	1,200	2	do.....	1,000
25	do.....	1,000	1	do.....	800
2	do.....	800	2	do.....	500
1	do.....	700	1	do.....	300
2	do.....	300	1	do.....	200
2	do.....	200			
71	Average salary.....	1,062	11	Average salary.....	613
				Average salary for the entire list.....	1,028
				Total cost for salaries.....	\$4,300

The inadequacy of these salaries will be seen when we compare them with those paid by the Government to physicians in the Army and the Navy.

Without attempting to set forth an ideal system, elaborate and expensive, I wish to emphasize some few changes and improvements which should be made on the score of humanity.

The number of physicians should be increased so as to bring medical aid within the reach of all Indians. That this is not the case at present, a few illustrations will indicate. The Navajo reservation, embracing a territory of 12,000 square miles and a population of 18,000, has but one physician; the Crow reservation, area 7,000 square miles, population 2,500, one. At Pine Ridge Agency one physician is charged with the care of over 5,500 Indians; at Rosebud Agency over 7,000; and at Standing Rock over 4,000, all widely scattered. Thousands of Indians at these agencies and others are utterly unable to have medical care when necessary, and the results are a large degree of needless suffering and hundreds of deaths that might in all probability have been prevented.

TITLE TO EXISTING INDIAN RESERVATIONS.

The Indian title has been extinguished to all the public domain, except Alaska, and the portion included in one hundred and sixty-two Indian

reservations, not embracing those in New York already referred to nor that occupied by the Cherokees in North Carolina, and by the Sacs and Foxes in Iowa, both of which were acquired by purchase.

Of these one hundred and sixty-two reservations there were established—

By executive order	56
By executive order under authority of act of Congress	6
By act of Congress	28
By treaty, with boundaries defined or enlarged by executive order	15
By treaty or agreement and act of Congress	5
By unratified treaty	1
By treaty or agreement	51
Total	162

TABLE 10.—Showing, by States, population of Indians and areas of Indian reservations.

State or Territory.	Area in acres.	Square miles.	Population.
Arizona	6,603,191	10,317½	17,779
California	494,045	772	12,739
Colorado	1,094,400	1,710	1,814
North Dakota	3,188,480	4,982	8,252
South Dakota	22,910,426	35,798½	21,461
Idaho	2,611,481	4,080	4,174
Indian Territory	39,199,530	61,249	79,602
Iowa	1,258	2	393
Kansas	102,026	159½	989
Michigan	27,310	42½	7,428
Minnesota	4,747,941	7,419	7,979
Montana	10,591,360	16,540	11,214
Nebraska	136,947	214	3,701
Nevada	954,135	1,490½	8,251
New Mexico	10,002,525	15,639	28,928
New York	87,677	137	5,046
North Carolina	65,211	102	8,000
Oregon	2,075,240	3,242	4,520
Texas			290
Utah	3,972,480	6,207	2,294
Washington	4,045,284	6,321	9,789
Wisconsin	512,061	800	7,503
Wyoming	2,342,400	3,600	1,945
Miscellaneous			1,302

Where it is suitable for agricultural or grazing purposes, it is the present policy of the Government to allot land in severalty to the Indians within their respective reservations—160 acres to heads of families, 80 acres to single persons over eighteen years of age, 80 acres to orphan children under eighteen years of age, and 40 acres to each other single person under eighteen years of age—to patent these individual holdings, with a restriction against alienation for twenty-five years, or longer, in the discretion of the President, and to purchase from the respective tribes any or all of the surplus land remaining after the allotments have been made. The general law for this is the allotment act of February 8, 1887 (24 Stat. p. 388), applicable to all reservations, except those of the five civilized tribes and three others in the Indian Territory, those in the State of New York, and one in Nebraska adjoining the Pine Ridge Sioux Reservation, which was set apart by Executive order for the purpose of suppressing liquor traffic with the Indians.

Leaving out the five civilized tribes and the Alaska Indians, it would take about 30,000,000 acres of land to give to every Indian in the United States—man, woman, and child—160 acres each. There would

still remain, in round numbers, 60,000,000 acres of Indian land, (exclusive of the reservations of the five civilized tribes), which, at \$1 per acre, probably a fair average, would yield \$60,000,000, the annual interest on which, at five per cent, would be \$3,300,000—a sum sufficient to pay the entire cost of educating all the Indian children in the United States. At the end of a few years, the principal sum might properly be distributed per capita among the rightful owners to assist them in improving their homes, when they could be left like other citizens to care for themselves.

INTEMPERANCE.

One of the most difficult things to contend with in the administration of Indian affairs is the vice of intemperance, under any circumstances an evil, but particularly so on an Indian reservation. A large proportion of the Indians live a life of comparative idleness, and are therefore liable to yield to the temptations of drinking, gambling, etc., as they would not if constantly employed.

So far as I have been able to learn, I do not think that the love for strong drink is any greater among them than among other people, for many of them are distinguished for sobriety. Before condemning them we should remember that white men among them have too often set the example of drunkenness, and in too many instances those employed to "civilize" the Indian have been but poor teachers in this respect. I have dismissed a number of employes for intemperance, and have refused to appoint any one who did not pledge himself to abstain from the use of intoxicating liquors as a beverage. I regret to say, however, that there are still in the Indian service men whose intemperance is a great hindrance to their usefulness. One inspector, reporting on the habits of an agent, admitted that he was intemperate, but suggested that it did not impair his faculties, nor disqualify him for his duties. I do not wish to demand too much of an Indian agent, but it does seem as if sobriety might be reasonably required of those who represent, or are supposed to represent, to the Indians the civilization which we are trying to induce them to accept in lieu of their present condition.

Intoxicating liquors are supplied to and almost forced upon the Indians by avaricious white men; for in the vicinity of reservations there are always those who carry on an active traffic in these commodities, and who, for the sake of the large profits to be made, are willing to run the risks of detection and the severe penalties provided for by law. (Secs. 2139 and 2140, Rev. Stat.) During the last year many complaints have been received from agents and others against parties charged with furnishing whisky to the Indians, and in a number of cases the Department of Justice has been requested to cause indictments to be brought.

Sections 2139 and 2140 of the Revised Statutes provide as follows:

Sec. 2139. No ardent spirits shall be introduced, under any pretense, into the Indian country. Every person (except an Indian in the Indian country) who sells, exchanges, gives, barter, or disposes of any spirituous liquors or wine to any Indian under the charge of any Indian superintendent or agent, or introduces or attempts to introduce any spirituous liquor or wine into the Indian country, shall be punishable by imprisonment for not more than two years, and by a fine of not more than three hundred dollars. But it shall be a sufficient defense to any charge of introducing or attempting to introduce liquor into the Indian country that the acts charged were done by order of or under authority from the War Department, or any officer duly authorized thereunto by the War Department.

SEC. 2140. If any superintendent of Indian affairs, Indian agent, or sub-agent, or commanding officer of a military post, has reason to suspect or is informed that any white person or Indian is about to introduce or has introduced, any spirituous liquor or wine into the Indian country in violation of law, such superintendent, agent, sub-agent, or commanding officer, may cause the boats, stores, packages, wagons, sleds, and places of deposit of such person to be searched; and if any such liquor is found therein, the same, together with the boats, teams, wagons, and sleds used in conveying the same, and also the goods, packages, and peltries of such person, shall be seized and delivered to the proper officer, and shall be proceeded against by libel in the proper court, and forfeited, one-half to the informer and the other half to the use of the United States; and if such person be a trader, his license shall be revoked and his bond put in suit. It shall moreover be the duty of any person in the service of the United States, or of any Indian, to take and destroy any ardent spirits or wine found in the Indian country, except such as may be introduced therein by the War Department. In all cases arising under this and the preceding section Indians shall be competent witnesses.

Since April 22, 1889, the date of the opening of Oklahoma to settlement, especial difficulty has been experienced in preventing the introduction and sale of intoxicating liquors upon the several reservations of the Indian Territory and of Oklahoma. In the suppression of these evils Leo E. Bennett, Indian agent for the Union Agency in the Indian Territory, has rendered very intelligent and efficient service, and large quantities of alcohol, whisky, beer, and cider which had been shipped to points within his jurisdiction have been destroyed by the Indian police under his direction.

The railroad and express companies in the Indian Territory have made his duties much more arduous than they would otherwise have been by their refusal to permit the Indian police to search their offices, claiming that the agent had no authority of law to delegate to his policemen the power to make such searches. But Agent Bennett has recently informally advised me that an amicable arrangement has been reached by which the co-operation of the railroad companies in this matter has been secured, and by which much of the illicit traffic will be prevented.

In a circular letter of September 18, 1889, the superintendent of the Wells-Fargo Express Company instructed his agents that, as the attorneys of the said company were of the opinion that section 2139 of the Revised Statutes does not by its terms prohibit the introduction into the Indian country of such drinks as beer, ale, porter, etc., they would thereafter accept packages of such drinks for shipment to points in the Indian Territory. A copy of this letter was transmitted to the Department, with my report on the subject, November 13, 1889. This office refuses to accept the construction placed on the law by the express company's attorneys, and in his instructions to his police, Agent Bennett has included in the list of liquors to be destroyed, all drinks that produce intoxication. So far as known there is no disposition on the part of the express company to test in the courts the right of the Indian Agent to take such action as coming within the meaning of the statute, and this is regarded as an acceptance of the situation on their part.

Another phase of the question was presented by a letter of March 26, 1890, from the Secretary of State, transmitting to the Department a copy of a note dated February 14, 1890, and of a *pro memoria* from the British Minister asking on behalf of the British Government to be advised whether this Government had the disposition so to amend the law in regard to the sale of intoxicants to Indians as to make it applicable also to Canadian Indians temporarily within the United States. He requested that you would acquaint him with your views as to the sufficiency of the present law, and the practicability of a compliance

with the wishes of Great Britain by an amendment of the law, should such action seem necessary.

These letters were referred to this office for report, and April 5, 1890, I had the honor to state that—

This office would favor an amendment to the law in question so as to make it applicable to all cases of furnishing liquor to Indians within the United States, without respect to the relations said Indians bear to this Government, and to whether they or their tribes are under the charge of a United States Indian Agent or not.

Such an amendment, besides being a compliance with the wishes of the British Government on the subject, which appears to be actuated by a humane desire to promote the welfare of the Indians in Canada, would enable this Government to extend its protection against the evil effects of whisky drinking, and the pernicious influences of white men who furnish them with whisky, to many of its own Indians who are not affected by existing laws, and is in my opinion much to be desired.

Further, in my report of August 4, replying to the letter of July 17, 1890, from the chairman of the Committee on Foreign Affairs of the House of Representatives, expressing the doubt entertained by that committee as to the constitutional power of Congress to "prohibit the sale of liquor (to Indians) within the States," I referred to decisions by the Supreme Court of the United States relative to the power granted to Congress over the subject of commerce with Indian tribes by section 8 of the Constitution of the United States, which seem to fully confirm its power to prohibit the sale of liquors to Indians, whether within the territorial limits of a State or not, and transmitted a draught of a bill by which it is proposed to amend sections 2139 and 2140 of the Revised Statutes, so that they will read as follows:

SEC. 2139. No spirituous or malt liquors or wine shall be introduced, under any pretense, into the Indian country. Every person who sells, exchanges, gives, barter, or disposes of any spirituous or malt liquors or wine to any Indian, or introduces or attempts to introduce any spirituous or malt liquors or wine into the Indian country shall be punishable by imprisonment for not more than two years, and by a fine of not more than three hundred dollars. But it shall be a sufficient defense to any charge of introducing or attempting to introduce liquor into the Indian country that the acts charged were done by order of or under authority from the War Department or any officer duly authorized thereunto by the War Department.

SEC. 2140. If any Indian agent, subagent, officer of Indian police, or commanding officer of a military post has reason to suspect or is informed that any person is about to introduce or has introduced any spirituous or malt liquors or wine, or any intoxicating beverage whatsoever into the Indian country in violation of law, such agent, subagent, officer of Indian police, or commanding officer of a military post may cause the boats, stores, packages, wagons, sleds, and places of deposit of such person to be searched; and if any such liquor is found therein, the same, together with the boats, teams, wagons, and sleds used in conveying the same, and also the goods, packages, and peltries of such person shall be seized and delivered to the proper officer, and shall be proceeded against by libel in the proper court, and forfeited, one-half to the informer and the other half to the use of the United States; and if such person be a trader his license shall be revoked and his bond put in suit. It shall moreover be the duty of any person in the service of the United States, or of any Indian, to take and destroy any ardent spirits or wine found in the Indian country, except such as may be introduced therein by the War Department. In all cases arising under this and the preceding section Indians shall be competent witnesses.

It is hoped that Congress will adopt the legislation suggested on this subject, so that the progress of the Indians may not be retarded on account of the insufficiency of the laws designed to protect them against the vice of intemperance.

In the Government schools, where thousands of Indians are being educated, especial pains are taken to inculcate principles of temperance, and scientific instruction is given as to the evil effects upon the human system of alcohol and narcotics. The good effects of this training are already becoming evident.

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RAILROADS OVER RESERVATIONS.

Incident to the growing population and material advancement of the Western States and Territories, especially those bordering on the Indian Territory, increasing demands are made upon Congress for legislation authorizing the construction and extension of lines of railway across the Indian lands. Bills introduced in Congress are generally referred to this Bureau for opinion and report as to whether such construction should be authorized.

While it is not believed that Indian reservations should be allowed to stand as barriers to the development of the country surrounding them, it is the opinion of this office that legislation authorizing the building of railroads through reservations should be framed with a due regard to existing treaty stipulations, and, whenever practicable, it should require the consent of the Indians.

* * * * *

TABLE 11.—Showing the agencies at which Indian judges were employed; the number of Indians at such agencies; the number of judges allowed, and for what time, and at what salary, during the fiscal year ended June 30, 1890.

Agencies.	Indians.	Judges.	Period em- ployed.	Salary per month.	Agencies.	Indians.	Judges.	Period em- ployed.	Salary per month.
			Mos.					Mos.	
Blackfeet, Mont.	2,293	3	8	\$8.00	Pawnee, Oklahoma.	851	3	7	\$5.00
Cheyenne and Arapaho, Oklahoma.	3,598	3	8	8.00	Pima, Ariz.	11,518	3	8	8.00
Cheyenne River, S. Dak.	2,846	3	8	8.00	Pine Ridge, S. Dak.	5,611	1	8	8.00
Crow Creek, S. Dak.	1,104	3	8	8.00	Ponca, Oklahoma.	533	3	7	5.00
Devil's Lake, N. Dak.	2,356	3	8	8.00	Puyallup, Wash.	1,844	6	8	5.00
Flathead, Mont.	2,018	4	8	8.00			10	8	3.00
Fort Hall, Idaho.	1,600	3	8	8.00	Santee, Nebr.	1,354	3	8	8.00
Green Bay, Wis.	3,320	3	8	4.17	Shoshone, Wyo.	1,945	4	8	8.00
Kiowa, Oklahoma.	4,088	3	8	8.00	Siletz, Oregon.	606	1	8	5.00
Klamath, Oregon.	904	3	8	8.00	Standing Rock, N. Dak.	4,110	3	8	8.00
Lower Brule, S. Dak.	1,067	3	8	8.00	Tongue River, Mont.	867	3	8	8.00
Mescalero, N. Mex.	474	2	8	5.00	Umatilla, Oregon.	983	2	8	8.00
Nevada, Nev.	736	3	8	8.00	Yakama, Wash.	1,675	3	8	4.17
Nez Percés, Idaho.	1,450	3	8	8.00	Yankton, S. Dak.	1,760	3	8	8.00
Otoe, Oklahoma.	396	3	7	5.00	Total.		93		

TABLE 12.—Showing agencies at which Indian judges have been recommended for the fiscal year ending June 30, 1891, with number of Indians at said agencies, the number of judges, and the salaries recommended, the period of service being the entire fiscal year.

Agencies.	Indians.	Judges.	Salary per month.	Agencies.	Indians.	Judges.	Salary per month.
Blackfeet, Mont.	2,293	3	\$10	Pima, Ariz.	11,518	3	\$10
Cheyenne and Arapaho, Ok- lahoma.	3,598	3	10	Ponca, Oklahoma.	533	3	5
Cheyenne River, S. Dak.	2,846	3	10	Puyallup, Wash.	1,844	6	5
Coville, Wash.	2,301	3	8			10	5
Crow Creek, S. Dak.	1,104	3	10	Quapaw, Ind. T.	1,150	3	8
Devils Lake, N. Dak.	2,356	3	10	Shoshone, Wyo.	1,945	4	10
Flathead, Mont.	2,018	4	10	Siletz, Oregon.	606	1	8
Fort Hall, Idaho.	1,600	3	10	Standing Rock, N. Dak.	4,110	3	10
Green Bay, Wis.	3,320	3	5	Tongue River, Mont.	867	3	10
Kiowa, Oklahoma.	4,088	3	10	Tulalip, Wash.	1,233	3	8
Lower Brule, S. Dak.	1,067	3	10	Umatilla, Oregon.	983	2	10
Mescalero.	474	2	5	White Earth, Minn.	6,239	3	10
Nevada.	959	3	10	Yakama, Wash.	1,675	3	5
Nez Percés, Idaho.	1,450	3	10	Yankton, S. Dak.	1,760	3	10
Otoe, Oklahoma.	396	3	5	Total.		98	
Pawnee, Oklahoma.	851	3	5				

The importance, dignity, and in many cases unpopularity of the position of an Indian judge is such that it should command a salary of at least \$10 per month; and the services rendered by the court are of such value in promoting good order and good morals in the community, as well as in familiarizing Indians with the customs, practices, and ideas which they will hereafter meet in white communities, that courts ought to be established for nearly every agency. To enable the office to do this the full amount asked for this year, viz, \$15,000, will be required, and I trust that Congress at its next session will recognize the wisdom of appropriating that sum.

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INDIAN POLICE.

In my annual report for last year I called your attention to the subject of the Indian police, urging that increased compensation be given to these men in order that they might receive something like a fair recompense for their services. I cited the fact that the general allotment act, approved February 8, 1887 (24 Stats. 390), provided that in the employment of Indian police preference should be given to those who had availed themselves of the provisions of said act and had taken allotments. Also the further fact that the Indians who had taken their lands in severalty were generally the most energetic and progressive members of their respective tribes, and that to carry out the requirements of the act and appoint them to positions where they would be compelled to devote themselves to the Government service, to the neglect of their own business, at a pittance of \$10 per month, could but work hardship and retard their advancement in agriculture and other civilized pursuits.

In the act making appropriations for the fiscal year ending June 30, 1891, Congress has increased the pay of police officers from \$12 to \$15 per month, but that of privates remains the same, \$10 per month.

I desire again earnestly to recommend that the pay of both officers and privates be increased, the former to \$25 and the latter \$20 per month, for the importance of this force to the service can not be overestimated. Experience has demonstrated that its members compare favorably in fidelity, courage, loyalty, and honor with any similar body, even when composed of men of higher civilization.

The question has been asked whether these policemen can be depended upon, especially in the endeavor to suppress the liquor traffic on reservations. The testimony of the various agents is almost universal that they are proving themselves worthy of confidence and that they render valuable service in maintaining order and suppressing crime. Almost without exception they are courageous, faithful, determined men, and hesitate at no danger when carrying out instructions. They are not only of practical assistance to the agents in making arrests, removing intruders, seizing contraband goods, etc., but they also act as a deterrent upon the lawless element of a tribe, as the fact that the agent has at hand a reliable police force prevents crime and disturbance which might otherwise prevail. Further, there are frequent occasions when but for this force the services of the military would have to be called in, often at great expense; and in some instances no doubt loss of both life and property might ensue before their arrival. These contingencies are avoided by the presence at the agency, ready on call, of a reliable body of men, authorized to act for the preservation of the peace.

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TABLE 13.—Showing the agencies at which Indian police were employed, the number of Indians at such agencies, and the number of officers and privates allowed during the fiscal year ending June 30, 1890.

Agencies.	Indians.	Officers.	Privates.	Total of force.	Agencies.	Indians.	Officers.	Privates.	Total of force.
Blackfeet, Mont.	2,293	2	17	19	Osage, Oklahoma.....	1,496	1	4	5
Cheyenne and Arapaho, Oklahoma.....	8,598	3	20	32	Otoe, Oklahoma.....	396	1	5	6
Cheyenne River, S. Dak.	2,846	2	25	27	Ouray, Utah.....	1,630	1	6	7
Colorado River, Ariz.....	979	.....	5	5	Pawnee, Oklahoma.....	831	1	7	8
Colville, Wash.....	2,301	2	14	16	Pima, Ariz.....	533	1	7	8
Crow, Mont.....	2,456	2	14	16	Pine Ridge, S. Dak.....	11,518	1	10	11
Crow Creek, S. Dak.....	1,104	1	8	9	Ponca, Oklahoma.....	5,611	3	35	38
Devil's Lake, N. Dak.....	2,356	2	16	18	Pottawatomie and Great Nemaha, Kans.....	989	1	11	12
Flathead, Mont.....	2,018	1	14	15	Payallup, Wash.....	1,844	.....	13	13
Fort Belknap, Mont.....	1,793	1	15	16	Quapaw, Ind. T.....	1,159	1	6	7
Fort Berthold, N. Dak.....	1,195	1	7	8	Rosebud, S. Dak.....	7,886	3	40	43
Fort Hall, Idaho.....	1,600	1	14	15	Round Valley, Cal.....	531	.....	5	5
Fort Peck, Mont.....	1,891	2	17	19	Sac and Fox, Oklahoma.....	2,180	1	8	9
Grande Ronde, Oregon.....	374	.....	5	5	Santee, Nebr.....	1,354	.....	11	11
Green Bay, Wis.....	3,320	1	10	11	Shoshone, Wyo.....	1,945	1	12	13
Hoop Valley, Cal.....	476	.....	2	2	Siletz, Oregon.....	606	1	7	8
Jicarilla, N. Mex.....	801	1	7	8	Sisseton, S. Dak.....	1,487	1	5	6
Kaw, Oklahoma.....	206	.....	2	2	Southern Ute, Colo.....	1,013	1	12	13
Kiowa, Oklahoma.....	4,088	3	24	26	Standing Rock, N. Dak.....	4,110	3	24	27
Klamath, Oregon.....	904	1	7	8	Tongue River, Mont.....	807	1	7	8
La Pointe, Wis.....	4,713	1	16	17	Tulalip, Wash.....	1,223	1	11	12
Lemhi, Idaho.....	524	1	5	6	Utah, Utah.....	674	1	6	7
Lower Brulé, S. Dak.....	1,067	1	13	14	Umatilla, Oregon.....	982	1	9	10
Mescalero, N. Mex.....	474	1	10	11	Union, Ind. T.....	65,209	3	40	43
Mission, Cal.....	4,524	.....	6	6	Warm Springs, Oregon.....	853	1	9	10
Navajo, N. Mex.....	20,200	1	14	15	Western Shoshone, Nev.....	477	1	7	8
Neah Bay, Wash.....	736	1	7	8	White Earth, Minn.....	6,299	3	22	25
Nevada, Nev.....	959	2	12	14	Yakama, Wash.....	1,675	1	7	8
Nez Percé, Idaho.....	1,450	.....	5	5	Yankton, S. Dak.....	1,760	1	7	8
Omaha and Winnebago, Nebr.....	2,347	1	7	8	Total.....	.....	70	700	770

INDIAN FARMING.

That the Indians may as soon as possible become self-supporting and have the advantages and comforts of civilization is, of course, the wish of all those who are interested in their welfare, many of whom believe that this end is most likely to be attained by educating, encouraging, and assisting them to become farmers or to engage in stock-raising. There is, in fact, no other form of labor for a large majority of them.

That this should be a difficult undertaking may appear strange to those unfamiliar with existing conditions, conditions which seriously interfere with rapid progress or successful results. Indians who have lived to be, say, forty, without ever having done manual labor, do not offer very promising material for enterprising farmers, and a great number of the present generation are of this class. On the other hand, many are too young to understand the necessity of thinking and working for themselves, and, with no stimulating example before them, they naturally take little or no interest in work of any kind. The necessary labor and care connected with farming are irksome to them, and their half-hearted and often injudiciously directed efforts, bringing little return, are soon relaxed or altogether abandoned.

The act of March 3, 1875 (18 Stats. 449), requires that all able-bodied Indians between the ages of eighteen and forty-five must labor for the benefit of themselves or of the tribe, in order to be entitled to rations. But it is obvious from experience, that the limits of twenty and forty years include all that can be expected to succeed in learning to farm

for the first time, and this leaves but a limited number of the entire Indian population available.

It must also be borne in mind that great portions of some of the reservations (actually much the greater part of several of the largest reserves) are, owing to various causes, totally unfit for agricultural purposes. Whatever science or irrigation may accomplish in the future, this condition of the land at the present time makes it necessary to scatter the Indians singly or in small communities on the fertile spots of their reservations, wherever found; owing to this fact many of these small farming settlements are 60, 65, and some even 100 miles from the agency headquarters. Under these circumstances it is impossible for the agent to give the Indians the attention they require, or for the farmers employed to properly instruct and assist them, to be with them as much as they should be, or to give sufficient time to any one point.

Another drawback has been the holding of lands in common, leaving the Indian uncertain whether or not a piece of land which he had improved was actually his own property. This difficulty, however, is being removed by the allotment of lands in severalty.

Knowing the difficulties to be surmounted, I have instructed agents to require from every farmer employed by the Government a monthly statement as to his work. For this purpose blanks have been prepared which contain, among others, the following points upon which the farmer must report:

- Number of days occupied in the field during the month.
- Number of days at headquarters.
- Number of Indians assisted and instructed.
- Number of Indians who have been induced to begin farming.
- Number of acres plowed.
- Number of acres planted.
- The condition of stock.
- The condition of agricultural implements.

He is also directed to state the most pressing needs of the Indians under his charge for such articles as lumber, seeds, agricultural implements, and stock.

These reports indorsed by the agents have been prepared by many of the farmers and, as a general thing, indicate that they are qualified for the work intrusted to them.

From these reports, some of them covering only nine months, from October, 1889, to June, 1890, it is ascertained that during that time in 35,000 cases Indians have been personally assisted and instructed in farming; that 46,000 acres have been plowed, and that at nearly every agency the need of a greater supply of lumber, seeds, and agricultural implements is very pressing. It is also reported that 1,136 Indians who never farmed before have been induced to commence farming.

According to last year's census the entire Indian population on the reservations where farmers were allowed during the year was but 107,283. A close estimate as to the number of those who can be expected to work on a farm would be one-seventh of this number—15,326. This for the nine months in question gives 8 per cent. as those who have been induced for the first time to commence farming. Had these reports been for the year, from all farmers employed, and exhaustive instead of partial, these figures would have been largely increased. On the whole, I consider these reports encouraging.

The following table, prepared from the reports of agents, exhibits status of farming, etc., by Indians, exclusive of the five civilized tribes, up to date, crops ungathered being estimated.

TABLE 14.—*Showing number of allotments made, acres cultivated, crops raised, and other results of Indian farming.*

Number of allotments made to July 1, 1890, under act of February 7, 1887 .	15, 166
Number of Indian families engaged in farming	27, 328
Number of acres under fence	608, 937
Number of acres under cultivation (by Indians)	256, 613

CROPS RAISED.

Bushels of wheat	881, 419
Bushels of oats and barley	545, 032
Bushels of corn	1, 139, 297
Bushels of vegetables	482, 580
Tons of hay cut	130, 712
Pounds of butter made	92, 968

NUMBER AND KIND OF STOCK OWNED BY INDIANS.

Horses and mules	443, 244
Cattle	170, 419
Swine	87, 477
Sheep and goats	964, 759
Domestic fowls (all kinds)	143, 056

FARMING STATIONS.

One drawback which at ration agencies has greatly hindered progress in farming has been the practice of requiring the whole body of Indians to come to agency headquarters to receive supplies. For example, many of the Indians connected with the various Sioux agencies are located in communities of fifty to one hundred and fifty persons, on lands which they are engaged in cultivating, many miles from agency headquarters. To compel such to come to the agency, 60 or 70 miles each week, or even month, through the storms of winter and the heat of summer, bringing the whole family, as is the custom, leaving crops and cattle to care for themselves, wearing out teams and wagons, and wasting time by being almost constantly on the road, is to inflict hardship on the very best element of this tribe—those who are trying to become self-supporting and are faithfully endeavoring by their own labor to make homes for themselves and to secure their families against want.

This class should be encouraged by every available means in their struggle toward civilization and self-support and they should have all the advantages which a white farmer requires. Their supplies should be convenient, and it should not be necessary for them to drop their farm-work at a critical time and travel a hundred miles to have a plow fixed.

They should have the constant presence of an experienced farmer to teach and encourage them, and it would be well that his wife should be able to teach the women and girls their domestic duties. The example set before them of a well-conducted home would be of great benefit. It might also be that each of the farmers could, with Indian assistants, cultivate a small farm himself, the returns from the farm to go toward reducing the expenses of the station.

There should be a day-school, at least, established in each community.

There should be a blacksmith shop at each station, with a good Indian mechanic in charge, who should also be able to do rough carpenter work, repairing wagons, etc.; and tools of both kinds should be furnished him.

Arrangements should be made by the agents to visit these stations once a month and to take with them, and issue there, a monthly ration of supplies, taking the receipts of the Indians as required by law.

Should this plan be adopted, a considerable amount of transportation will be necessary, and this will give employment to Indian teamsters, who will thus be enabled to earn some money at times when they can spare their horses and wagons from farm-work.

On the 3d of last March I addressed a letter to the Department setting forth the evils of the present system and outlining the plan suggested above, which received your approval. Active measures are now in progress for the carrying out of the new plan at the following agencies: Rosebud, Crow Creek, and Lower Brulé, S. Dak.; Standing Rock, N. Dak.; Crow, Mont.; Shoshone, Wyo.; Uintah and Ouray, Utah; and Cheyenne and Arapaho, and Kiowa, Comanche and Wichita, Oklahoma.

The establishing of these new, independent communities will of necessity increase for a time the number of farmers required for their instruction. The estimates submitted by the various agents for such additional farmers as are required for the year ending June 30, 1891, amount to over \$62,000. The sum appropriated by Congress is \$60,000. In view of the progress now being made in the allotment of lands, and of the importance that the Indians should be prepared for this step by intelligent instruction in the proper use of their land, and considering that every acre put under cultivation yields a substantial return for the labor and money expended, I recommend that for the fiscal year ending June 30, 1892, the sum of \$100,000 be appropriated for the pay of additional farmers.

The Indians should be given distinctly to understand that the employment by the Government of white farmers is a temporary expedient, to be abandoned at an early day. They should be taught that they must very soon depend entirely upon themselves, and that their future prosperity will depend largely upon the use they are now willing to make of the opportunities for learning to farm offered to them by the Government.

IRRIGATION.

Large bodies of lands now included in reservations are practically worthless for farming purposes, without irrigation. The spread of the white population over the public domain, the reduction of reservations, the confining of Indians to ever-narrowing borders, makes the problem of their support one of increasing difficulty and urgency. White people are able to combine in the creation of expensive and extensive irrigating plans, which the Indians can not do. From the attention which I have been able to give to the subject, I am led to believe that by the expenditure of moderate sums of money in constructing reservoirs and irrigating ditches, employing Indians to perform most of the labor, and instructing them in the construction, care, and use of these reservoirs and ditches, large numbers of them may be prepared for self-support. It is my purpose during the coming year to pay special attention to this matter, collect suitable data, and lay before you in my next annual report some plan of operation. The matter can not safely be deferred any longer. What has already been done in this direction warrants belief in the advisability of doing much more.

LOGGING BY INDIANS.

WHITE EARTH AGENCY, MINN.

As early as July 19, 1889, the agent of White Earth Agency, Minn., requested authority for the Indians of White Earth, Red Lake, and White Oak Point to cut and bank for sale during the coming season—1889 and 1890—dead and down timber from their several reservations, explaining that it was necessary for them to receive authority in time to put up hay, make roads, prepare camps, etc.

Desiring to know whether these Indians were deserving of this privilege, and, if so, whether they were properly prepared for the work, August 5, 1889, I addressed a series of inquiries to their agent, who replied as follows:

(1) None of the Indians have killed or girdled any of the green standing timber, or started fires in the woods.

(2) I propose to have a competent overseer to superintend all the camps and to personally inspect the cutting and scaling of the logs, to see that there will be no green timber cut, at a compensation of \$100 per month during the logging season, said salary to be paid out of stumpage fund. The stumpage should be \$1 per thousand feet, and I will collect that amount for each thousand feet from the Indian contractor and deposit said fund for the benefit and relief of the poor and indigent Indians. I propose to allow the Indians to sell to responsible lumber dealers, under contracts subject to my approval and the approval of the Department, logs to be paid for in cash before being removed from the landing. I will collect the \$1 per thousand stumpage and pay the remainder to the Indian contractors, all of whom have business qualifications and are well able to manage their own affairs.

(3) No green trees have been killed or girdled.

(4) No green standing timber has been cut for market, and, in my opinion, a competent overseer in charge would effectually prevent the cutting of green timber.

(5) The Indians who expect to engage in logging are prepared to carry on the same, and, in my opinion, it would be advisable to allow them to do so, thereby furnishing employment and means of a livelihood for a large number of Indians who otherwise would be idle and without any means of supporting themselves and families, as Indians are to be employed in every capacity they can fill, thus employing but very few white men, such as foremen, cooks, blacksmiths, and teamsters.

Considering the question of their whisky drinking, would say that when actually employed they are less liable to drink than when idle.

* * * * *

CASH PAYMENTS TO INDIANS.

As I consider the payment of cash to Indians, except in return for service rendered or labor performed for themselves or their people, as of very little real benefit in a majority of cases, it is with pleasure that I give below a statement of moneys earned by Indians during the year and paid to them by the Government:

Paid to regular Indian employés at agencies	\$21,500
Paid to irregular Indian employés at agencies	54,500
Paid to Indian additional farmers	9,000
Paid to regular Indian employés at Indian schools	51,000
Paid to irregular Indian employés at Indian schools	22,000
Paid to Indian interpreters	20,000
Paid to Indian policemen	94,000
Paid to Indian judges of courts of Indian offenses	5,000
Paid to Indians for hauling supplies	90,000
Paid to Indians for produce, hay, wood, and other supplies purchased from them, and for breaking land	66,000
Paid to Indians for logs cut and banked by them	139,000
Total	642,000

* * * * *

I submit below a table showing areas of reserves and population of Indians assigned to the several agencies, with amounts of bonds and salaries of agents and amounts disbursed by them during the fiscal year ending June 30, 1890.

TABLE 15.—Showing areas of reserves and number of Indians under the several Indian agencies, with amounts of bonds and salaries of agents and amounts disbursed by them during the fiscal year ended June 30, 1890.

Agency.	Area in square miles.	Popula- tion.	Bond.	Amount of annual disburse- ment.	Salary.
Blackfeet, Mont.	2,750	2,173	\$30,000	\$150,000	\$1,600
Cheyenne River, S. Dak.	4,431	2,823	20,000	150,000	1,600
Cheyenne and Arapaho, Oklahoma.	8,713	3,372	30,000	200,000	2,200
Colorado River, Ariz.	470	840	15,000	20,000	1,500
Colville Agency, Wash.	5,348	2,421	20,000	30,000	1,500
Crow Creek and Lower Brulé, S. Dak.	1,708	2,084	25,000	120,000	1,400
Crow, Mont.	7,304	2,456	25,000	120,000	2,000
Devil's Lake, N. Dak.	473	2,400	15,000	20,000	1,200
Eastern Cherokee, N. C.	103	3,000	2,000	None	800
Flathead, Mont.	2,240	1,764	20,000	20,000	1,500
Fort Berthold, N. Dak.	4,550	1,163	20,000	30,000	1,500
Fort Belknap, Mont.	810	1,722	20,000	115,000	1,000
Fort Hall, Idaho	1,350	1,493	20,000	30,000	1,500
Fort Peck, Mont.	2,775	1,842	40,000	165,000	2,000
Grand Ronde, Oregon	96	379	15,000	20,000	1,000
Green Bay, Wis.*	483	3,164	20,000*	30,000	1,500
Houma Valley, Cal.	180	475			
Klamath, etc., Oklahoma	5,801	4,121	20,000	200,000	2,000
Klamath, Oregon	1,050	805	10,000	30,000	1,100
Lemhi, Idaho	100	443	10,000	20,000	1,000
La Pointe, Wis.	748	4,778	20,000	25,000	2,000
Mescalero, N. Mex.	741	513	20,000	25,000	1,000
Mission Tule River (consolidated), Cal.	432	4,056	25,000	25,000	1,000
Navajo, N. Mex.	16,741	15,000	25,000	25,000	2,000
Neah Bay, Wash.	38	606	10,000	15,000	1,000
Navaho, Nev.	1,001	973	10,000	20,000	1,500
New York, N. Y.	137	5,112	20,000	25,000	1,000
Nez Percés, Idaho	1,107	1,715	20,000	25,000	1,000
Omaha and Winnebago, Nebr.	124	2,385	25,000	40,000	1,000
Osage and Kaw, Oklahoma.	2,454	1,778	125,000	500,000	1,000
Pima, Ariz.	775	8,000	10,000	20,000	1,000
Pine Ridge, S. Dak.	4,920	5,701	50,000	300,000	2,200
Ponca, Pawnee, Otoe, and Oakland, Oklahoma.	944	1,843	20,000	100,000	1,500
Pottawatomie and Great Nemaha, Kans.	196	1,016	40,000	75,000	1,000
Pueblo, N. Mex.	1,417	8,285	10,000	10,000	1,000
Puyallup (consolidated), Wash.	304	2,051	25,000	40,000	1,000
Quapaw, Ind. T.	202	1,225	20,000	50,000	1,500
Round Valley, Cal.	159	582	15,000	10,000	1,200
Rosebud, S. Dak.	5,044	5,345	50,000	400,000	2,200
Sac, Carlos, Ariz?	3,950	4,810	20,000	100,000	2,000
Southern Ute and Huerfano, Colo.	2,360	1,793	25,000	75,000	1,400
Sisseton, S. Dak.	1,235	1,509	20,000	25,000	1,500
Standing Rock, N. Dak.	4,176	4,090	50,000	225,000	1,700
Sac and Fox, Oklahoma.	2,320	2,062	25,000	50,000	1,200
Sac and Fox, Iowa	2	309	20,000	20,000	1,000
Santee, Nebr.	2	1,378	20,000	50,000	1,200
Shoshone, Wyo.	3,650	1,058	25,000	75,000	1,200
Siletz, Oregon	351	571	15,000	20,000	1,300
Tongue River, Mont.	580	805	15,000	40,000	1,500
Tulalip, Wash.	27	1,212	10,000	10,000	1,000
Umatilla, Oregon	420	999	15,000	20,000	1,200
Union, Ind. T.	30,014	67,000	50,000	100,000	2,000
Utah and Outay, Utah.	6,207	1,821	40,000	100,000	1,400
Warm Springs, Oregon.	725	923	15,000	30,000	1,000
White Earth, Minn.	9,092	6,406	50,000	75,000	1,000
Western Shoshone, Nev.	488	597	10,000	20,000	1,500
Yakama, Wash.	1,250	1,459	30,000	30,000	2,000
Yankton, S. Dak.	672	1,725	20,000	80,000	1,000
Average salary.					1,533.33

*Agent at Green Bay is required to file a special bond in the sum of \$100,000 to cover logging money.

From this table it will be seen that the average salary is but little more than \$1,533. The agent is furnished transportation for himself

to the agency and return; he has quarters for himself and family; he is allowed a team with feed, and his office is supplied with fuel and lights. He is allowed a clerk, and is entitled to the services of the agency physician for himself and family. He is expected to furnish all supplies used by his family, though he may buy of the Government at cost price. His hospitality is in many cases severely taxed, owing to the entire absence of places of entertainment for visitors.

PURCHASE, INSPECTION, AND SHIPMENT OF SUPPLIES.

After due advertising, sealed bids to the number of 513 for furnishing goods and supplies for the Indian service were opened in New York on May 23, 1890, in the presence of a large number of bidders or their agents, by myself, assisted by Assistant Secretary Cyrus Bussey and members of the Board of Indian Commissioners. At the opening of bids at San Francisco by the assistant commissioner, July 16, 1890, 45 bids were received; making a total of 558. The number of contracts awarded was 254, each one being made out in quadruplicate and accompanied by a bond for 50 per cent. of the amount of the contract. The awards were made in all cases with the aid of expert inspectors, and only after careful comparison of samples submitted and for such goods as the best interests of the service seemed to require. Special pains were taken to select serviceable goods; but the lowest-priced goods are not always cheapest. The supplies purchased consist of subsistence supplies, such as beef, bacon, coffee, sugar, lard, hominy, rice, corn meal, oat meal, salt, hard bread, pork, etc., and of miscellaneous goods, clothing, agricultural implements, etc., which are divided into seventeen classes, as follows:

- | | | |
|---------------------|--------------------------------|--|
| 1. Blankets. | 9. Crockery and lamps. | 14. Paints and oils. |
| 2. Cotton goods. | 10. Furniture and wooden-ware. | 15. Brass and iron kettles, tin and tinware. |
| 3. Woollen goods. | 11. Harness, leather, etc. | 16. Stoves, hollow ware, pipe, etc. |
| 4. Clothing. | 12. Agricultural implements. | 17. Hardware. |
| 5. Boots and shoes. | 13. Wagons and wagon fixtures. | |
| 6. Hats and caps. | | |
| 7. Notions. | | |
| 8. Groceries. | | |

There were also purchased large quantities of medicines, surgical instruments, books and school supplies, in all over 2,500 articles. Over 50,000 samples were submitted, examined, and passed upon.

The delivery, inspection, and shipment of most of the supplies takes place in New York, in a warehouse rented for the purpose, at 67 Wooster street; but such articles as wagons, plows, iron, steel, stoves, fence wire, etc., are inspected and shipped from Chicago, St. Louis, Kansas City, etc., as may be most advantageous. Beef and flour are delivered at the agencies. The other subsistence supplies, except coffee, sugar, and rice, are generally delivered at points in the West, the points of delivery being governed by the price bid for the article plus the cost of its transportation to the agencies and schools. During the fiscal year ended June 30, 1890, 34,316 packages, weighing 4,297,049 pounds, were shipped from New York, and 46,091 packages, weighing 4,388,743 pounds, were shipped from Chicago, St. Louis, Kansas City, Sioux City, Omaha, and other points west. A detailed record of each shipment is kept, which shows the mark, number, kind of package, character of contents, and weight. Receipts for packages shipped are made in triplicate and are also copied in a book kept for that purpose. This enables the office to

trace any package; and, in case of shortage on arrival at an agency, to locate and determine the liability for the deficiency.

After the delivery of the goods and before they are accepted and shipped, an expert inspector examines them and compares the deliveries with the sample or samples on which awards have been made. If equal in quality to sample, they are accepted and shipped; if not, they are rejected, and the contractor is required to furnish other goods up to sample. If he fails to do so, they are purchased at his expense in open market, and the difference in cost, if any, is charged against him. In some instances, where the necessities of the service require immediate deliveries, and the deviation from sample is not material, goods not quite up to the sample are accepted, in accordance with a clause in the contract which provides for such a contingency. In such cases the inspector fixes the difference in value between the sample upon which the award has been made and the goods offered for delivery, and a deduction of twice the amount fixed by the inspector as the difference in value is made from the account. Inferior goods, however, even at a deduction, are accepted in very few cases, and only when they are needed for immediate use and can not be procured otherwise.

For every shipment the contractor makes out invoices in quadruplicate; the original goes to the Treasury for payment, one copy remains in the Indian office, one is mailed to the agent or school superintendent, and the fourth is required to accompany the bill of lading, in order that the freight may be identified when payment is made for its transportation. For the fiscal year ending June 30, 1890, over 30,000 invoices were required for that purpose.

In this connection, I desire to say that one cause of great embarrassment in the management of the affairs of this Bureau is the failure of Congress to make the appropriations for the Indian service so that deliveries of goods may be made before winter sets in. Under a ruling of the honorable Second Comptroller no contracts can be executed until after the President has signed the appropriation act and it has become a law. Much time is necessarily consumed in work preliminary to letting the contracts. Under the law, advertisements must be published for at least three weeks. To abstract the bids, classify the large number of samples offered and make the awards, takes from two to six weeks. Then it takes from fifteen to twenty-five days before contracts can be executed and approved, bidders being scattered all the way from Maine to California, and contracts having to be mailed to them for execution. Blankets, clothing, wagons, boots, shoes, and a number of other articles, have to be manufactured after contracts and bonds are approved.

It is, therefore, evident that unless the Indian appropriation bill passes early in the session, (and it should never pass later than the middle of February) many of the goods and supplies can not reach their destination until late in the winter, and in consequence the Indians suffer. Even if the Indian appropriation bill should become a law as early as February, no goods could be shipped under the most favorable circumstances until the end of June. The treaties with the Crows, Sioux, Cheyennes, Arapahoes, Utes, etc., make provision for issuing clothing, and stipulate that it shall be delivered at the Government warehouse on the reservation not later than August 1 of each year, a promise which this office has never been able to keep.

The present system of purchasing and delivering supplies to Indians involving publicity, competition, and inspection, needs only care and

judgment in buying, and honesty in inspection and delivery, to insure general satisfaction. It is not possible, however, to furnish to Indians clothing suitable as to size, and the "misfits" must be many, ludicrous and vexatious.

INDIAN FINANCES.

FUNDS AVAILABLE DURING THE FISCAL YEARS 1889-'90, AND 1890-'91.

Appropriations.—The following statement shows the amounts that were appropriated by Congress for the Indian service for the fiscal years 1889-'90 and 1890-'91:

TABLE 16.—*Showing appropriations for 1889-'90 and 1890-'91.*

Appropriations.	1889-'90.	1890-'91.	Increase.
Fulfilling treaties with Indian tribes, permanent.....	\$1,428,654.90	\$1,543,675.29	\$115,020.39
Fulfilling treaties with Indian tribes, annual.....	1,585,796.84	1,597,740.00	11,943.16
Support of Indian tribes, gratuities.....	762,500.00	746,000.00	43,500.00
Support of Indian schools.....	1,379,668.13	1,842,770.00	463,201.87
Incidental and contingent expenses.....	169,000.00	171,000.00	2,000.00
Current and miscellaneous expenses.....	818,331.50	1,226,209.40	407,877.90
Total.....	6,083,851.37	7,127,394.69	1,043,543.32

Under the head of "Fulfilling treaties with Indian tribes, permanent," are such specified sums as are required to be appropriated annually under existing treaties, either for a certain number of years or for an indefinite period.

A number of treaties contain provisions for clothing, subsistence, agency and school employes, etc., to be furnished by the United States for a certain number of years, but such provisions do not state specifically the amount of money that must be appropriated. These amounts are annually approximately estimated by this office, and the sums so appropriated can be used only for expenditures incurred during the fiscal year for which the appropriations are made. The total sums so appropriated by Congress for the fiscal years 1889-'90 and 1890-'91 are to be found in above table (No. 16), under the head of "Fulfilling treaties with Indian tribes, annual."

A number of the tribes have no treaties; others have treaties, but the amounts due thereunder are not sufficient for their support. Congress annually appropriates certain sums as gratuities. The total sums appropriated for such purpose for the fiscal years 1889-'90 and 1890-'91 are to be found in above table, under the head of "Support of Indian tribes, gratuities."

For Indian education Congress annually appropriates certain sums in addition to those provided for under existing treaties. The total amounts of such appropriations for the fiscal years 1889-'90 and 1890-'91 are found in above table, under the head of "Support of Indian schools."

For contingent and incidental expenses of agents and their employes, for aid for certain tribes in Arizona, California, Nevada, Oregon, Utah, and Washington, etc., Congress annually appropriates certain sums, the totals of which for the fiscal years 1889-'90 and 1890-'91 are found in the above table, under the head of "Incidental and contingent expenses."

For pay of agents, interpreters, Indian police, additional farmers, Indian inspectors, superintendent of schools, for the erection and repair of agency buildings, surveying and allotting land, advertising, tele-

graphing, transportation of Indian supplies, and for a number of other purposes, Congress annually appropriates certain sums. The total amounts appropriated for these purposes for the fiscal years 1889-'90 and 1890-'91 are found in the above table under the head of "Current and miscellaneous expenses."

Unexpended balance.—In addition to the appropriations named in Table — there were available for expenditure, at the commencement of the fiscal years 1889-'90 and 1890-'91, the following unexpended balances of permanent Indian funds:

TABLE 17.—*Showing unexpended balances of permanent funds available for 1889-'90 and 1890-'91.*

Balances.	1889-'90.	1890-'91.	Increase.	Decrease.
Of funds appropriated, treaty stipulations of a permanent character	\$624,052.07	\$739,211.91	\$114,353.24	
Of funds appropriated for erection of school buildings at various points	152,209.52	81,366.29		\$70,823.23
Of appropriations for negotiating treaties with certain Indian tribes, surveying and allotting Indian lands, digging ditches, and proceeds of sale of Indian lands	319,731.02	411,328.81	\$1,597.79	
Of Indian moneys, miscellaneous	132,105.68	153,843.24	21,737.56	
Total	1,228,704.29	1,385,750.26	227,876.69	70,823.23
Net increase			157,035.27	

Trust funds.—The total amount of trust funds, in bonds and otherwise, held at the beginning of the fiscal years 1889-'90 and 1890-'91 were as follows:

TABLE 18.—*Showing trust funds held at commencement of 1889-'90 and 1890-'91.*

Trust funds.	1889-'90.	1890-'91.	Increase.
Principal	\$20,909,556.93	\$21,244,818.39	\$335,261.46
Accrued interest, annual	1,041,513.80	1,058,376.87	16,763.07
Accrued interest, balance	893,931.81	967,406.43	73,474.62
Total	22,754,402.54	23,270,601.69	\$516,029.15

The increase arises from the sale of land by the Osages, Otoes, Omahas, and other tribes.

Funds available and expenditures.—The following table gives the several funds which were available for Indian expenditures at the commencement of the past fiscal year and the amount which was expended during that year from each of said funds:

TABLE 19.—*Showing money available and expenditures made during fiscal year ended June 30, 1890.*

Sources.	On hand July 1, 1890.	Expended during year.
Fulfilling treaties with Indian tribes, permanent	\$1,428,654.00	\$636,443.50
Fulfilling treaties with Indian tribes, annual	1,585,716.24	1,687,602.55
Support of Indian tribes, gratuities	792,500.00	643,000.02
Support of Indian schools	1,879,666.13	1,147,825.78
Incidental and contingent expenses, Indian service	169,000.00	156,309.72
Current expenses	818,351.50	767,915.01
Interest on trust funds	1,041,513.80	877,456.18
Total	7,125,365.27	5,798,634.43

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TABLE 19.—Showing money available and expenditures made during fiscal year ended June 30, 1890—Continued.

Sources.	On hand July 1, 1889.	Expended during year.
Balances, permanent:		
Of funds appropriated under treaty stipulations of a permanent character.....	\$624, 658. 07	\$624, 658. 07
Of funds appropriated for erection of school buildings at various points.....	152, 209. 53	70, 823. 32
Of funds appropriated for negotiating treaties with certain Indian tribes, surveying and allotting Indian reservations, digging ditches, and proceeds of sales of Indian lands.....	319, 731. 02	237, 021. 68
Of Indian moneys, miscellaneous.....	132, 105. 68	39, 395. 48
Of interest on trust funds.....	803, 331. 81	
Total.....	2, 032, 036. 10	971, 698. 56
Aggregate.....	9, 157, 401. 27	6, 761, 333. 01

By summarizing the 1890-'91 columns of tables 16 and 17 and the last two items of that column in table 18, the total amount of funds available for expenditure for the Indian service during the fiscal 1890-'91 is ascertained.

TABLE 20.—Showing total money available for fiscal year ending June 30, 1891.

Sources.	Amount.
Appropriations.....	\$7, 127, 394. 69
Balances.....	1, 385, 759. 56
Interest on trust funds.....	1, 058, 276. 87
Interest, balances.....	967, 406. 43
Total.....	10, 538, 837. 55

TRUST FUNDS OF THE FIVE CIVILIZED TRIBES.

Of the \$21,244,818.39, principal held in trust, as shown in the 1890-'91 column of table 18, the sum of \$7,984,132.76 belongs to the five civilized tribes, in the following proportions:

TABLE 21.—Showing trust funds of the five civilized tribes.

Tribes.	Amount of principal.	Annual interest.
Cherokees.....	\$2, 625, 842. 37	\$137, 469. 33
Chickasaws.....	1, 308, 665. 65	68, 404. 85
Choctaws.....	549, 584. 74	32, 344. 73
Creeks.....	2, 000, 000. 00	100, 000. 00
Seminoles.....	1, 500, 000. 00	75, 000. 00
Total.....	7, 984, 132. 76	413, 219. 01

The interest on the principal of these funds is placed semi-annually with the United States assistant treasurer at St. Louis, Mo., to the credit of the treasurer of each nation, and the expenditure of these funds is entirely under the control of the nation and its council. This office has no control whatever over these expenditures.

TRUST FUNDS OF OTHER TRIBES.

The balance of the before-named sum of \$21,244,818.39, amounting to \$13,260,083.63, belongs to a number of tribes, as stated below, and the interest thereon, at 4, 5, 6, and 7 per cent., as the case may be, is either paid to or expended for the benefit of the respective tribes.

TABLE 28.—*Showing trust funds of tribes other than the five civilized tribes.*

Tribes.	Principal.	Tribes.	Principal.
Chippewas and Christian Indians	642,800.36	Pottawatomies	\$184,000.27
Delawares	274,178.54	Sacs and Foxes of Missouri	71,228.12
Eastern Shawnees	9,979.12	Sacs and Foxes of the Mississippi	53,002.21
Iowas	171,543.37	Santee Sioux	39,000.00
Kansas	27,174.41	Senecas	44,979.00
Kaskaskias, Peorias, Weas, and Piankeshaws	58,000.00	Senecas, Tonawanda band	40,000.00
Kickapoos	129,184.00	Senecas and Shoshones	12,100.00
L'Anse and Vieux de Sert bands	29,000.00	Shawnees	1,200.00
Menomonees	155,000.00	Stockbridges	75,000.00
Ojibwas	8,265,208.40	Shoshones and Bannocks	0,000.00
Omalas	240,597.07	Umatillas	55,465.61
Otoes and Missourians	600,775.43	Utes	1,100,000.00
Pawnees	208,025.07	Utah and White River Utes	2,340.00
Poncas	70,000.00	Total	13,260,083.63

The balances of accrued trust-fund interest, as shown in table 29, amounting to \$967,406.43, are applicable for such expenditures as from time to time may be found to be proper.

DEPREDACTIONS.

Indians have depredated on the property of white people and of other Indians from the time of the earliest settlements. Many of the Indian wars which disturbed the frontiers and threatened the existence of exposed villages in colonial times originated in this way, and early efforts were made to prevent or remedy the evil by legislation.

The first of such legislation is found in the act of May 19, 1796, (1 Stat., 472), which provided that if the Indians took or destroyed property, the owner should present his claim to the superintendent or agent of the tribe charged, who would demand satisfaction from the Indians. If it was not made within eighteen months, the superintendent or agent was to report the claim and his action thereon to the President; and, "in the meantime in respect to the property so taken, stolen or destroyed, the United States guarantied to the party injured an eventual indemnification," provided he did not seek private satisfaction or revenge. This act also provided for deducting the amount "out of the annual stipend which the United States are bound to pay the tribe;" and further, that the Indian charged might be arrested, etc. This and subsequent conciliatory acts also provided that if the property of a friendly Indian should be taken by a white man, the same should be paid for out of the Treasury of the United States, provided the Indian did not seek private revenge.

The act "to regulate trade and intercourse with the different tribes and to preserve peace on the frontiers," approved June 30, 1834 (4 Stat., 749), not only re-enacted all the provisions above mentioned, but restrained white people from going on to the reservations without a license from the agent or other person in charge. It also provided that claims against Indians should be barred unless presented for payment within

three years from the date of the injuries complained of. The law stood thus until the act approved February 28, 1859 (11 Stat., 401), repealed that clause of the act of June 30, 1834, which provided that indemnity should be made out of the Treasury of the United States, but left unchanged and unrepealed the obligation of the Indians to pay for losses out of their annuities. By a joint resolution of June 25, 1860, Congress declared that this repeal should not be so construed as to destroy any right to indemnity which existed at the date of the same, *i. e.*, February 28, 1859; from which it would seem that claims originating prior to that time were not affected by the act of that date.

The act of July 15, 1870 (16 Stat., 360), provided that no claim for Indian depredations should be paid in future except by special appropriation by Congress. The act of May 29, 1872 (17 Stat., 190), directed the Secretary of the Interior to prepare rules and regulations prescribing the manner of presenting depredation claims under existing laws and treaties, and the kind and amount of testimony necessary to establish their validity, also to investigate the claims presented and report them to Congress at each session, whether allowed or not, together with the evidence on which his action was based. Since this date, this office has prepared these reports, and the work was done by its Civilization and Education Division until after the passage of the act of March 3, 1885; it was then transferred to the Depredation Division, which, however, did not receive official designation as such until January 1, 1889.

A clause in the Indian appropriation act of 1885 (23 Stat., 376), set aside \$10,000 "for the investigation of certain Indian depredation claims." This act provided (1) for making and presenting to Congress at its next session a complete list of all Indian depredation claims then on file; and (2) for the investigation and report to Congress of depredation claims in favor of citizens of the United States, chargeable against any tribe of Indians by reason of treaty stipulations. The first part of this work was transmitted to Congress March 11, 1866, and is to be found in Executive Document 125, Forty-ninth Congress, first session.

To carry out the second requirement, the Secretary of the Interior was authorized to cause such additional testimony to be taken as would make it possible to form a just estimate of the kind and value of the property damaged or destroyed. For this purpose special agents were employed and sent to the scenes of the alleged depredations, and additional clerks were appointed in this Office to report the claims to the Department for transmittal to Congress as rapidly as investigated. The number of employes in this division, exclusive of the special agents (who are five in number), has been as low as two and as high as six; there are now four.

Much of the first year's work was rendered useless for the following reason: The construction placed upon the act of March 3, 1885, by both the Indian Bureau and the Department of the Interior, was that claims barred by the limitation clause of the act of June 30, 1834 (4 Stat., 731, sec. 17), were not entitled to investigation on their merits. Hence they were simply examined to see whether they had been filed "within three years from the commission of the injuries," and if not, they were briefly reported as "barred" and not entitled to consideration. When quite a number had been thus disposed of Congress, by the act approved May 15, 1886 (24 Stat., 44), which appropriated \$20,000 for continuing the investigation of the class of claims designated in the act of March 3, 1885, added the clause, "and the investigation and re-

port shall include claims, if any, barred by statute, such fact to be stated in the report." This change in the law necessitated the return from Congress or the Department of all claims which had been reported as "barred" and not examined on their merits.

At the request of this office, the Assistant Attorney-General for the Interior Department rendered an opinion August 23, 1886, as to what claims were subject to investigation on their merits under the act of March 3, 1885, as amended by the act of May 15, 1886. This opinion was to the effect that two classes of claims came within the provisions of these acts: First, all claims on file March 3, 1885, in favor of persons who were citizens of the United States at the dates of the alleged depredations for losses at the hands of Indians whose tribe had a treaty with the United States at the time of the losses, whether such claims were barred by statute or not. Second, all claims growing out of depredations committed since December 1, 1873, because the latter part of the seventeenth section of the act of June 30, 1834 (containing the limitation clause which barred claims if not filed within three years from the date of the depredation) was omitted from section 2156 of the Revised Statutes, which is a re-enactment of the first part of said seventeenth section. Thus when the Revised Statutes went into effect December 1, 1873, the limitation clause was removed, and the bar being no longer operative, claims could be filed at any time, if for a depredation committed subsequent to that date. A recent decision, however, has placed December 1, 1870, instead of December 1, 1873, as the time subsequent to which claims may originate and still be entitled to investigation, for the reason that if the bar had not become complete by the expiration of the full time to which it was limited, it was ineffectual and inoperative.

Under these decisions the claims on file have been classified as subject to consideration and not subject to consideration. The first class comprises two groups: One of claims on file March 3, 1885, whether barred or not; the other, claims filed since March 3, 1885, but for depredations committed since December 1, 1870. The latter class may be subdivided into two groups, one containing defects curable by the claimants, and the other defects curable only by statute. Both groups may be again subdivided into several classes.

Those defects curable by the parties are, (1) lack of proof in compliance with the Department rules, which require that the evidence of two witnesses should support each claim, that the tribe which committed the alleged depredations shall be designated, and that the testimony shall have been taken before some officer duly authorized to administer oaths in such cases; (2) loss of material papers in the case when the claim has at some time been sent to an agent or to Congress, or where the papers have been returned to claimant, his agent or attorney, for amendment and never refiled. The claims with defects curable only by statute are: (1) Those for depredations committed prior to December 1, 1870, and not on file March 3, 1885; (2) those in favor of citizens, but for depredations committed by Indians not in treaty relations; (3) those in favor of Indians because of depredations by other Indians or by white men; and (4) those in favor of white persons not citizens of the United States.

The records do not show that any depredation claims were filed in this office prior to 1849, up to which time the bureau was a part of the War Department, although it is possible that some may have been so filed. If so, the record of them has never been transmitted here. During the last forty years, or since this bureau was transferred to the Interior Department, over 6,000 claims have been presented, but the Gov-

ernment has not carried out its oft-repeated guaranty of "eventual indemnification" in even 300 of them. From 1796 to 1859 there was an implied contract on the part of the Government to pay its citizens for property lost by Indian depredations "out of any money in the Treasury not otherwise appropriated," and from 1859 to 1870 the obligation still rested on the Government to deduct the amount of properly-established claims from the annuities due the tribes charged with the depredations; but only a few of these claims have been paid or otherwise adjudicated.

The number so disposed of was stated in my last report as 54, aggregating \$218,190.10, but this number included only such claims as had been paid by act of Congress and were mentioned in the acts providing for their payment.

A thorough examination of the office records shows that 220 other claims have been, at various times before May 29, 1872, referred by the Department of the Interior to the Second Auditor for settlement, and it is presumed that these have been paid either directly from the Treasury or from the annuities due the tribe of Indians charged with the depredation, so that the number of claims which have been filed and are no longer pending may be stated with tolerable accuracy as 274, aggregating \$784,268.42, on which \$434,570.93 was allowed.

When the act of March 3, 1885, was passed there were on file in this office 3,846 Indian depredation claims, involving a total of nearly \$14,000,000. Between that time and the close of the fiscal year ending June 30, 1885, there were filed 93 claims, involving nearly \$900,000, so that, as shown in my last report, there were on file June 30, 1885, 3,939 claims, aggregating \$14,879,088.

Owing to the great amount of work required to prepare the list of claims which are found in Executive Document 125, as heretofore explained, and the fact that many of those reported under the act of March 3, 1885, as being "barred" had to be re-investigated under the amended act of May 15, 1886, the real work of reporting claims for submission to Congress in pursuance of the above acts did not begin until about June 30, 1886, and those reported since then have been sent to Congress regularly in January of each year.

The following tables will show the number of claims filed and disposed of; those subject to investigation and those which can be rendered subject to investigation under existing laws; the number embraced in each of the four classes where the defects are curable only by statute, and the total amount involved in each class:

Table 23.—Showing number of depredation claims on hand and received since March 3, 1885.

	No. claims.	Amount in- volved.
Claims on file March 3, 1885	3,846	\$13,981,816
Claims filed between March 3 and June 30, 1885	93	897,272
Claims filed during fiscal year ending June 30—		
1886	163	674,939
1887	109	382,514
1888	769	1,907,685
1889	509	1,383,104
1890	559	1,695,609
Total	6,053	20,922,939

Table 24.—Showing number of depreciation claims disposed of up to June 30, 1890.

	No. claims.	Amount allowed.	Amount claimed.
Paid or otherwise adjudicated by the Secretary of the Interior prior to the act of May 29, 1872.....	229	\$216,580.83	\$428,184.71
Paid under authority of various acts of Congress prior to March 3, 1885.....	63	208,140.19	311,621.71
Paid under authority of acts of Congress since March 3, 1885... Reported to Congress January 1—	2	16,086.09	16,456.66
1887.....	205	278,825.89	1,086,021.67
1888.....	309	336,728.42	664,463.68
1889.....	226	377,145.41	1,670,664.37
1890.....	164	215,588.68	797,625.65
Total.....	1,371	1,646,917.33	4,612,623.67
Pending in Indian Office June 30, 1890.....	8,632		16,319,128.31

Table 25.—Showing the number of depreciation claims subject to consideration on file June 30, 1890.

	No. claims.	Amount involved.
(a) On file March 3, 1885.....	1,779	\$7,909,450.49
(b) Filed since March 3, 1885.....	571	2,203,246.47
Total.....	2,350	\$10,112,696.96

Table 26.—Showing the number of depreciation claims on file June 30, 1890, not subject to consideration.

	No. claims.	Amount involved.
(c) Because of defects curable by the claimants.....	580	\$4,129,803.54
(d) Because of defects curable only by statute.....	1,809	\$6,437,433.93
Total.....	2,389	\$10,567,237.47

Class *c* need not be subdivided into the groups previously mentioned for the reason that in many instances if the papers were returned from Congress, the Indian agent, the claimant or his attorney, they would still be found defective in some way, and would have to be placed in another subdivision of the same class.

Class *d* is subdivided as follows:

Table 27.—Showing number of claims on file June 30, 1890, not subject to consideration because of defects curable only by statute.

	No. claims.	Amount involved.
(1) Claims for depreciations committed prior to December 1, 1870, and not on file March 3, 1885.....	1,705	\$4,817,673.53
(2) Claims for depreciations committed by Indians not in treaty relations.....	181	1,043,806.18
(3) Claims in favor of Indians.....	338	1,158,708.27
(4) Claims in favor of white persons not citizens of the United States.....	16	87,483.10
Total.....	1,809	\$6,037,433.93

During the fiscal year ending June 30, 1890, 124 claims subject to investigation, involving over a half million dollars, were placed on file; 435 claims not subject to investigation, involving over a million dollars, were also filed and are included in the above tables.

When the act of March 3, 1885, became a law there were on file in this office 3,574 claims, omitting those previously paid or otherwise disposed of, and although 1,097 claims have been reported to the Department and two have been paid, there were still pending June 30, 1890, 4,682 claims; an increase of 1,108. Of these 4,682 only 580 require amendments which the claimants can make, and it is submitted that the remaining 4,102 are all entitled to consideration under existing law.

The acts of March 3, 1885, and May 15, 1886, making appropriation for the investigation of certain classes of claims, did not affect other classes cognizable under the acts of June 30, 1834, February 28, 1859, and May 29, 1872, but as the appropriation is confined to certain classes of claims, it can not be legally used for any other.

It will be noticed in Table 24 that only 164 claims, involving \$707,-825.65, were reported to the Department during the year 1889, as against 229 claims, involving \$1,070,003.37, during the previous year. This apparent falling off in the amount of work was caused by an entire reorganization of the clerical force of the division. The beneficial results of the changes made are now shown, however, in the fact that while during the first six months of 1889, there were 82 claims reported on, involving \$315,000, there were reported on by the same number of clerks during the first six months of 1890, 207 claims, which involved \$822,000. The force of special agents was also changed during last year, and while some time was lost by them in getting to their respective fields and in becoming familiar with their duties, the following table will show that they have performed their work industriously and creditably:

Table 22.—Showing the number of claims satisfactorily investigated by special agents in the field during each fiscal year since the passage of the act of March 3, 1885.

Claims investigated during fiscal year ending June 30—		Claims investigated during fiscal year ending June 30—	
1885	0	1888	272
1886	37	1889	201
1887	127	1890	417

It was shown in my last report that during the fiscal year ending June 30, 1889, 202 claims, involving \$881,107 were reported to the Department. During the fiscal year ending June 30, 1890, 289 claims, involving \$1,214,825.65, have been so reported.

Much difficulty has been experienced in communicating with claimants, especially where the claims originated nearly half a century ago, and considerable time has been taken up with this branch of the work. That it has resulted in bringing to light and into shape a number of such claims is shown by the fact that while last year 800 amounting to \$5,145,965.48, were not in condition for present consideration because of curable defects, now only 580, amounting to \$4,480,938.53, are so defective.

It was formerly the practice to send claims to the special agents in the order of their filing without regard to location. This practice has been abandoned, and the agents are now located where the claims are most numerous so that both time and money are saved.

With the small force of employes warranted by the appropriation (\$20,000), the work of investigating and reporting these claims is being

faithfully performed, but the fact that they have increased at the rate of more than 200 a year over the number disposed of, shows the urgent necessity for an increased appropriation, so that sufficient force may be employed, both in the office and in the field to bring them up to date.

While the number of claims filed last year exceeded that of the previous year, and was greater than those of 1886 and 1887 combined, a large percentage of them are for depredations committed several years ago, and must not be taken as evidence that depredations are increasing. On the contrary, as the Indians are more closely confined to their reservations, or as they take land in severalty and adopt the habits of civilized life depredations perceptibly decrease, and only a few have been reported as occurring within the last few years.

I submit three interesting and suggestive tables. Table 29 shows the number of depredations committed by Indians and the losses occasioned thereby as indicated by claims presented each year, from 1812 to 1889. Table 30 shows such depredations and valuation of losses arranged by decades. Table 31 gives the names of the tribes to which the depredations are chargeable, with the number of depredations committed by each tribe, and the amount of losses thereby occasioned.

Table 29.—Showing the number of depredations committed each year, from 1812 to 1889, and the total amount involved in the claims.

Year.	No.	Amount.	Year.	No.	Amount.	Year.	No.	Amount.
1812.....	1	\$7,348	1852.....	59	\$107,736	1871.....	162	\$553,331
1811.....	1	5,770	1853.....	74	232,896	1872.....	244	693,111
1832.....	2	225	1854.....	69	262,391	1873.....	124	292,323
1833.....	4	1,155	1855.....	207	690,231	1874.....	121	341,656
1834.....	5	2,281	1856.....	218	567,568	1875.....	35	142,434
1835.....	25	11,206	1857.....	120	276,689	1876.....	34	122,625
1836.....	20	13,860	1858.....	135	293,785	1877.....	181	326,656
1837.....	26	8,876	1859.....	147	248,866	1878.....	266	842,398
1838.....	8	1,322	1860.....	161	608,627	1879.....	63	142,682
1839.....	4	1,815	1861.....	133	1,098,675	1880.....	221	1,019,315
1843.....	3	264,240	1862.....	286	880,593	1881.....	84	292,334
1844.....	3	4,205	1863.....	160	302,213	1882.....	34	89,429
1845.....	1	75	1864.....	225	1,616,887	1883.....	9	89,671
1846.....	4	69,896	1865.....	269	1,371,471	1884.....	29	124,162
1847.....	40	176,443	1866.....	344	1,907,371	1885.....	82	168,682
1848.....	20	125,063	1867.....	399	1,791,505	1886.....	6	16,138
1849.....	26	194,054	1868.....	487	1,876,314	1887.....	6	6,417
1850.....	22	120,086	1869.....	339	578,751	1888.....	3	675
1851.....	51	150,252	1870.....	240	448,503	1889.....	7	5,131
	272	1,169,384		4,948	14,748,482		1,793	5,003,078
							4,045	34,748,482
							272	1,169,384
Total.....							4,053	26,922,339

Table 30.—Showing the foregoing by decades.

	Number of claims.	Amount.
Prior to 1840.....	96	\$54,138
1840 to 1850.....	101	825,846
1850 to 1860.....	1,099	2,972,322
1860 to 1870.....	2,782	11,616,477
1870 to 1880.....	1,094	3,360,610
1880 to 1889.....	476	1,762,563
Total.....	6,658	26,922,339

Table 31.—Showing the number of depredations committed by each tribe and the amount involved.

Tribe.	No.	Amount.	Tribe. *	No.	Amount.
Comanche.....	1,031	\$3,116,169	Ponca.....	25	\$38,621
Apache.....	759	3,548,466	Pottawatomie.....	23	7,887
Cheyenne.....	638	2,369,777	Oregon.....	19	124,229
Sioux.....	637	2,763,498	Sac and Fox.....	19	269,645
Navajo.....	484	1,687,730	Yakama.....	18	75,998
Kiowa.....	310	1,411,111	Wichita.....	17	6,821
Chippewa.....	184	155,963	Crow.....	16	30,129
Pawnee.....	169	214,520	Payallup.....	12	14,145
Osage.....	160	227,115	Omaha.....	11	4,067
Nez Percés.....	157	357,399	Creek.....	10	59,472
Ute.....	135	489,166	Modoc.....	10	29,334
Rogue River.....	134	431,226	Cayuse.....	10	38,243
Bannock.....	119	280,883	Shoshone.....	9	54,265
California Indians.....	96	708,659	Caddo.....	9	18,120
Arapaho.....	68	295,978	Walla Walla.....	8	61,093
Nisqually.....	66	118,109	Coquille.....	7	12,027
Winnebago.....	58	73,251	Skaquamish.....	7	3,676
Keechic.....	52	55,365	Pima and Maricopa.....	6	9,762
Kilkatet.....	50	138,678	Flatheads.....	6	11,505
Washington Territory Indians.....	48	84,527	Menomonee.....	6	580
Black feet.....	40	216,651	Hualapais.....	5	42,769
Kansas or Kaw.....	36	65,261	Otoe.....	5	3,564
Piutes.....	35	335,140	Einha.....	3	398
Snake.....	34	149,343	Iowa.....	3	252
Cherokee.....	29	84,220	Prairie Indians.....	3	13,325
Southern Refugee Indians.....	29	5,009	Lipan.....	3	6,760
Kickapoo.....	27	53,146	Pend d'Oreille.....	3	1,740
Cow Creek.....	25	30,151			
	5,590	19,345,651		273	941,497
				5,590	19,345,651
Miscellaneous and unknown tribes.....				5,863	20,287,058
Committed by white persons, including United States soldiers, emigrants and rebels.....				102	312,945
				68	322,936
Total.....				6,053	20,922,939

Very respectfully, your obedient servant,
T. J. MORGAN,
Commissioner.
 THE SECRETARY OF THE INTERIOR.

SUPPLEMENTAL REPORT OF THE COMMISSIONER OF INDIAN AFFAIRS.

REPORT OF TOUR OF OBSERVATION AMONG AGENCIES AND SCHOOLS IN THE SOUTHWEST.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., December 8, 1890.

SIR: In accordance with the authority which you granted me, I left Washington September 5 for a tour of observation among the Indian agencies and schools. I was absent ninety days, and during that time traveled some 8,000 miles, more than 1,000 of which was by ambulance and carriage. I visited the reservations at Fort Hall, Idaho, and Pyramid Lake, Nevada; spent ten days among the Mission Indians and Yumas of southern California, and traveled 600 miles in company with General McCook through the Apache, Navajo, and Moqui Reservations of Arizona. I also visited the Pima and Papago Reservations of the same Territory, the Cheyenne and Arapaho, Comanche, Kiowa, Wichita, Ponca, Otoe, Osage, and Kaw Reservations, in Oklahoma.

I inspected most of the schools, Government, boarding, and day schools, contract and mission schools on these reservations, the non-reservation Government schools at Genoa, Nebr.; Grand Junction, Colo.; Carson, Nev.; Albuquerque and Santa Fé, N. Mex.; Chilocco, Oklahoma, and Lawrence, Kana.; and the contract schools at Denver, Colo.; San Diego and Banning, Cal.; Tucson, Ariz.; Albuquerque and Santa Fé, N. Mex.

I sent to the office detailed reports on the reservations and schools which have been, from time to time, laid before you for your information. I desire now to give simply some of the general impressions which I have received as a result of this tour of observation.

First. The present status of the Indian service is more favorable than I had expected to find it. The agents and employes generally are apparently devoting themselves to the work in hand with a sincere purpose to promote the welfare of the Indians, and an intelligent appreciation of the methods best calculated to accomplish the results. I was glad to find so little indication of either moral unfitness or unfaithfulness to duty. The practical difficulties are many, often insurmountable, and the slowness of progress is due largely to circumstances that no amount of fidelity on the part of agents and employes can overcome.

In some instances I felt obliged to peremptorily discharge employes, either for immorality or for unfaithfulness, but I am glad to be able to bear testimony to the general high character of the service as I saw it.

Second. I found comparatively little to criticise in the schools, and was gratified to find so able and faithful a body of men and women as those whom I met in these institutions. Their work is peculiarly trying, their deprivations many, their facilities few, their discouragements great, but everywhere I found persons of high moral character striving earnestly and intelligently to promote the welfare of the children entrusted to their care. Buildings have been renovated, enlarged, repaired, and otherwise improved; schools have been better graded and more completely organized, and there is throughout the entire service, so far as I saw it, a spirit of hopefulness and progress. My suggestions and advice were most kindly received and, where possible, immediately acted upon.

Third. The progress of the pupils in the work of the schoolroom proper, and in the various industries, is all that could be reasonably expected, and no one can witness their work without a keen realization of the far-reaching and permanent results that are steadily flowing from these beneficent institutions. Nor can any one fail to see that, if the work which they are doing can be prosecuted intelligently and vigorously for a series of years along lines in which it is now moving, it will accomplish all that the most sanguine could expect.

Fourth. While there is much that is perplexing, and even discouraging in the condition of the Indians, there is, on the whole, cause for congratulation in their present progress and for hopefulness as to their future. I have been particularly impressed with the fact that they work. Everywhere I found them engaged more or less in manual labor. They cultivate the land; they tend their flocks; they engage, where opportunities offer, in various occupations for wages among white men, and there is everywhere, almost without exception, a desire to improve their condition. There is, too, a growing recognition of the fact that the old life of hunting and idleness is passing away never to return, and of the necessity laid upon them to earn their own subsistence by industry, and to provide for their own comfort by thrift.

They undoubtedly suffer much by contact with the rougher elements of society that hover on the border of our advancing civilization, but

are feeling also the better forces that come to them with this advancing tide.

Even where they do not understand, or possibly misapprehend what is meant by "lands in severalty," they are practically selecting individual holdings and are gradually emancipating themselves from the embarrassments incident to tribal life.

Fifth. The so-called "Messiah craze," of which so much has appeared in the public prints, is, so far as the Indians whom I have visited are concerned, greatly exaggerated. There is a widespread vague hope, mingled with a trembling expectation and faint desire, that a better day is dawning for them; that a great deliverer is to free them from some of the embarrassments and limitations forced upon them by the advancing civilization, for which they do not yet feel prepared, and possibly to restore some of the old conditions to which they look back with regret. Many of them, however, fully realize that the buffalo is gone forever; that the old conditions can never return, and that they must adjust themselves as fully and as speedily as may be to their new environment. Mingled with this material and religious Messianic hope is the recollection of many of the cruelties which they have suffered at the hands of their conquerors, and a desire to be avenged of their wrongs.

I held long and interesting councils with the Bannacks and Shoshones, the Mission Indians, Pimas, Apaches, Navajos, Moquis, Cheyennes, Arapahoes, Comanches, Kiowas, and others, and listened to their statements of grievances, their pleas for justice, and their entreaties for help. While undoubtedly some of their complaints are unfounded, and many of their appeals for assistance unwarranted, the fact remains that there is too much reason for them to feel that they have been subjected in very many cases to cruel and unjust treatment. While not desiring to conceal the defects of the Indians, or to deny that they have been sometimes wantonly cruel; that they have shown a lack of many sterling qualities, and an absence of the progressive spirit which characterizes the Anglo-Saxon, I can not refrain from expressing my profound conviction that if we had suffered at their hands what they have suffered at ours, we would have been neither so patient nor so forbearing as they have been.

The wonder is, not that the excitement regarding the coming Messiah should have been manifested among them, but rather that it has taken so mild a form and has been so easily controlled. So far as my own observation has extended, it is my conviction that there has been no occasion whatever for any alarm, and that the agents with their Indian police have been abundantly able to hold in complete control those under their charge. The only danger to be apprehended is that influences from without, emanating from those who in some manner might be benefited by the Indian uprising or the movement of troops, or by the excitement growing out of "wars and rumors of wars," may precipitate a needless conflict and bring on a disastrous and costly war. Of course this is said in regard to the Indians whom I have visited. I have not been among the Sioux of the Dakotas.

Sixth. The present policy of the Government of breaking up gradually the Indian reservations, allotting lands in severalty, extinguishing the Indian title, destroying tribal relations, dealing with the Indians in their individual capacity, absorbing them into the national life as American citizens, and giving to their children an English education is founded in good sense, is dictated by the spirit of humanity, and requires only to be faithfully, intelligently, and persistently carried out to secure the desired end. Enough has already been accomplished

to show that the plan is entirely feasible, and there is nothing in the present situation to warrant the Government in deviating from the policy adopted or in wavering in its prosecution. The work has been wisely planned, the foundations are being well laid, and every consideration of economy and philanthropy urges the continuance of that policy. One disastrous Indian war might be more expensive than the entire work of educating the whole rising generation and of preparing them for intelligent, self-supporting American citizenship.

Seventh. I have seen nothing whatever to shake my faith in the effectiveness and final triumph of the present system of Government schools. The work should be carried forward rapidly and vigorously until ample provision has been made for all Indian children of school age, and there should be at once a compulsory law, which will enable the Commissioner of Indian Affairs, wherever it may be necessary, to force attendance at school. This will seldom be required, but the fact that he has the power to compel attendance will be sufficient to insure the filling of the schools.

Not only should there be more schools, but there should be better schools. The policy of the Government in the past has been open, perhaps, to the criticism of building cheap and small buildings, providing insufficient facilities, paying low salaries, and failing to require a sufficiently high degree of efficiency in the school service. The Indians have complained frequently, and with justice, that their children were neither properly fed, clothed, nor instructed. I have found everywhere evidences of past neglect, and very many of the schools are still imperfectly equipped. It is my purpose to give very careful attention to these matters, and I shall endeavor more earnestly than ever to make these schools in all respects what they ought to be, in order that they may accomplish their difficult and invaluable work.

I see no reason for any essential modification of the plans adopted and now in successful operation of providing for the education of a large number of pupils in the industrial, non-reservation training schools. It is a cause for rejoicing that there are to-day at Carlisle over 800, at Haskell over 500, at Genoa 220, at Albuquerque nearly 200, at Ohlocco 170, and at other of these schools an increasing number, who are receiving a kind of training in immediate contact with our best civilization, which, from the nature of the case, can not be given on the reservations.

I was delighted, however, to find that the reservation boarding schools are not only capable of doing a much better work than I supposed they could do, but that they are actually doing it. No more hopeful work than this is in progress anywhere. The difficulties and embarrassments incident to reservation life are many and various, and yet there are great advantages in having a well-ordered school planted in the midst of a reservation where its influence is felt immediately, directly, and powerfully upon the semi-barbarous people for whose benefit it has been established. These schools are epitomes of our civilization and tangible object lessons brought to the very doors of the Indian wigwam. One of the pleasantest sights that anywhere met me was that of Indian parents with their blankets, paint, and feathers witnessing with interest, delight, and pride the exercises of their children in the reservation schools. These schools should be increased in number and efficiency.

For the present the places where day schools can be profitably maintained on the reservations which I have seen are not many, and yet their work as I observed it warrants me in recommending the estab-

lishment, wherever the conditions are favorable, of more of this class.

I studied carefully both the Government schools and the contract schools, and, while I know that "comparisons are odious," and I may be suspected, possibly, of partiality, I think it due simply as a matter of justice to say that no better work is now being done for these wards of the nation on the whole than that which is done in the Government institutions. I would not withhold credit from the contract schools nor would I undervalue their work in the slightest degree, but it is due to those who are working so faithfully, intelligently, and efficiently in institutions established and maintained by the National Government to give to the thousands of pupils intrusted to their care such training of body, mind, and heart; such instruction in morals, manners, and conduct; such development of skill in all the varied forms of industries, to say that their work is not surpassed elsewhere. In no single instance has any contract school which I have visited even professed to afford to its pupils the variety of industrial training which is provided for in the Government schools, and in several of them the lack of industrial training was painfully apparent.

I wish to bear emphatic testimony to the good work wrought by devoted missionaries, and to express the earnest wish that the churches will extend this work by sending a large number of earnest, intelligent, and industrious workers to establish missions and to bring the gospel within the reach of these benighted people, who as yet know little of true religion, and who have vague, superstitious, and false notions of God and His truth. Especially that earnest Christian women shall be sent out to teach Indian women how to ameliorate their condition, how to keep house, and how to make homes. Such missionaries can bring comfort and stimulus into unhappy blank lives, will raise the tone of morality and home life throughout the reservation, and may save from downfall and wretchedness many boys and girls returned home from distant schools.

I took considerable pains to inquire regarding the career of students educated at Carlisle, Hampton, and other schools after their return to the reservations, and feel warranted in saying that, considering all the circumstances, they have done as well as any one had the right to expect. In very many cases the life to which they return is entirely devoid of any encouragement or stimulus, oftentimes even of opportunity for living in accordance with what they have been taught in school. In some instances, indeed, they have been flogged to compel them to return to the old ways. Very many of the boys who return, after having learned a trade, have no tools or capital with which to begin work; those who have been taught farming have no farms to cultivate, no teams or implements with which to labor; and many girls who have learned the art of housekeeping have no houses to keep. Nevertheless, I found many returned students occupying positions in the Government service, others at work on the railroad, earning fair wages in machine shops, etc., and still others struggling heroically to overcome the almost insurmountable obstacles which they encounter in striving to better their own condition and improve that of their people. I was glad to find an apparent willingness on the part of the great majority of those whom I met to labor and to live the white man's way if only the opportunity presented itself.

It is my opinion, and I have found that it is shared by a large number of intelligent observers on the ground, that many of the young men and women who have been educated in schools off reservations and have returned to their homes, who are now under the control of the

non-progressive element and are forced by public opinion to discard something of their training and to return partially, at least, to the old ways, will, nevertheless, as they grow in years and experience and come to take their places as leaders, assert themselves and vindicate the training which they have received. Ten years hence many of those now boys and girls, diffident in asserting themselves and sometimes disappointing their friends, will be men and women, and will more than meet the reasonable expectations formed for them. It should be borne in mind also in the discussion of this question that the children of those who have been educated in our training schools will begin life under very different circumstances from their parents, and that the seed sown in the minds of the present generation will bring forth its best fruits in the lives of the next and succeeding generations.

It is a matter of very urgent importance that those who have been educated away from the reservation receive upon their return, if allowed to go back, such protection, encouragement, and timely assistance as will enable them to fulfill the expectations of their friends and to realize, in some degree at least, their own cherished hopes. I have not as yet formulated any general plan, but am confident that it will be practicable, in an increasingly large number of individual cases, to throw around them such influences and open to them such opportunities as will save them from lapsing into barbarism and to enable them to assist others in better living. I shall give to this matter my earnest thought.

Meantime I earnestly recommend that Congress make an appropriation of \$10,000 to be expended by the Indian Office under the authority of the Department in rendering such aid to returned students as may be most desirable. This help will take the form of giving to those who have learned trades a kit of tools with which to work; to those who shall farm a span of horses and a wagon; to many a little judicious help in the erection of a small house and the opening of a farm; to young women sewing machines, stoves and furniture, and other necessary articles for housekeeping; and by thus helping Indian youth to start in civilized pursuits in their own homes the Government will supplement and complete the work of the schools.

As I have come into relationship with these returned students I have been impressed with the idea that a much broader culture and more thorough training than that which most of them have been heretofore permitted to receive would result in giving them more maturity of view, greater fixedness of purpose, a more robust character, and would insure to them a better future. It should never be forgotten that pupils taken from the tepees with all its surrounding influences of barbarism and paganism, wholly ignorant of the English language and of the ways of civilized life, can not be expected in five years to master the English language, acquire the rudiments of an English education, form habits of industry and thrift, and to develop such moral characters as will fit them to resist temptation, assert their own manhood and womanhood, withstand the fearfully demoralizing influences of the camp, and, in spite of public sentiment and a cruel environment, to maintain their integrity and live a civilized life in the midst of their barbarous surroundings. To do so would be marvelous indeed, and we should not expect of the Indians what we never would think of demanding of Americans. So far as education is concerned Indian civilization is to be wrought out by giving to the entire mass of the rising generation a common school English industrial education, and to the few who are competent

to receive it that higher education necessary to prepare them for leadership.

Eighth. Second in importance only to that of the education of the children is the matter of promoting the material welfare of the Indians. They can no longer live by the chase and are of necessity forced to become for the most part either shepherds, farmers, or laborers. The Navajoes own vast flocks and herds, and excel as shepherds, and much can be done in assisting them to improve the quality of their herds and in encouraging them to build better homes and cultivate the soil. The large majority of Indians whom I have seen must depend upon the products of the soil, and whatever is done for them should be in the direction of assisting them in opening and developing farms. Most of the land which they occupy in Idaho, Nevada, California, Arizona, and New Mexico is practically worthless without irrigation. Many of them have already mastered this art and use it on a small scale very successfully. In many cases, however, the natural streams upon which they have depended have been taken from them by the irrigating canals built by the white man, and they have neither the capital nor the knowledge necessary to develop for themselves such systems of irrigation as are absolutely necessary for the redemption of the arid wastes in which they dwell. It is entirely feasible to bring under cultivation large bodies of most fertile land which will provide an ample support for all. This, however, must of necessity be done by the General Government and ought to be undertaken at once.

It should be carried on under the direction of civil engineers who are chosen for their expert knowledge, and should be so prosecuted as to encourage the Indians to self-help. It need not involve any large outlay of money, and all the expenses incident to it can be, if desirable, readily reimbursed to the United States either from funds now belonging to the Indians or from the sale of their surplus lands. But even if this were not the case the Government would be more than compensated for the expenditure required by the decreased cost of rations and supplies. It is possible and everywhere desirable that this matter should receive early attention and be carried forward until all these people become self-supporting.

The additional farmers who have heretofore been appointed by the Government to teach the Indians have not accomplished all that could have been done if they had been chosen with more care, had been afforded better facilities for doing their work, and had been more intelligently supervised. The fault has not in all cases been theirs, because they have oftentimes been required to do what from the nature of the case was impossible. In some instances which have come under my observation the agents have been at fault either in nominating incompetent persons, in not affording proper facilities, in failing to give them intelligent supervision, or in requiring them to perform not the work for which they were paid but other work of value to themselves.

Ninth. My observations have deepened the convictions which I expressed to you in my annual report as to the utter inadequacy of the provisions made by the Government for the care of the sick. The physicians employed are so few in number and are provided with such inadequate facilities for doing their work as to make it a physical impossibility for them to render proper medical assistance to those to whom they are sent. Numbers of Indians die for lack of such help and many others for want of proper nursing, and it is pitiful to be compelled to witness the suffering unavoidable under such circumstances.

If the Government pretends to provide for the sick it should increase the number of physicians, insist upon a higher standard of professional attainment, pay better salaries, and afford them better facilities for their work.

Common humanity dictates that some provision should be made in the way of hospitals and asylums for the care of the sick and aged, the infirm and feeble-minded.

Tenth. The one great test which should everywhere and always be applied to those who enter this service in any of its departments should be that of fitness. The opinion is still prevalent that the Indian service affords, in some mysterious way, exceptional opportunities for making money, and that those who enter it can secure better pay for less work there than elsewhere. There is a misapprehension as to the difficulty and importance of the work to be done, and an impression that anybody without special qualifications can succeed in it. The work, however, is exceptionally difficult, and calls for men and women of unusual qualifications and no others should be employed. I desire to lay special stress upon the desirability that those who represent the United States in this important work should themselves be good representatives of the civilization which they are employed to teach. Manuelito, chief of the Navajoes, speaking of a former dishonest agent, said to me in council that with all the people of the United States to select from it seemed to him it ought to be possible to find an honest man for a Navajo agent. His wise suggestion could, I think, be still further extended. With more than 60,000,000 of people to choose from it ought to be easy to find for the Indian service in all its branches men and women of good character, efficient, and faithful; and, indeed, a large proportion of those now employed are persons of such character and attainments. All should be such. Whatever amount of money may be expended for the Indians effects very little for their uplifting if it is disbursed by dishonest agents, administered by men of intemperate habits, or by persons unfaithful or incompetent.

A very serious drawback to progress is the uncertain tenure of office. Agents and employes if selected with special reference to their fitness should have a reasonable degree of certainty that they will be retained so long as they show fitness and fidelity in the discharge of their duties. Uncertainty as to permanence breeds indecision of purpose, largely prevents the formation of comprehensive plans which require years for their completion, and hinders the vigorous execution of those formulated by the Government. I see no good reason why politics should enter as a controlling element in the selection or removal of Government officials in this service. If there is any place in the entire range of official employment where the employe should feel untrammelled by mere partisan considerations, and free to devote his entire strength and time to the work to which he has been appointed, and where he is to be freed from the temptation to unfaithfulness or dishonesty by the fear of removal for mere political reasons, it ought to be in the Indian service. The spirit, if not the rules, of the civil service should be extended absolutely over this entire branch of public work. The Indians have no politics, and those sent to them as agents ought to be concerned absolutely and only with the promotion of their welfare.

This is especially true regarding the school service. It is a cardinal and well-established principle in the American mind that the public schools shall be nonpartisan, and so far as I know there is no community in the United States where the appointment and dismissal of school teachers is dictated by partisan politics. The schools are for

all and are generally administered on such broad principles as to be acceptable to all classes regardless of political differences, and school teachers are not usually subjected to the fluctuations of party sentiment. Every consideration which can be urged in favor of nonpartisan education in the public schools, and for the retention of school teachers during good behavior, has added weight when applied to Indian schools.

I think it not too strong a statement to make when I say from facts that have been brought to my personal attention, that the chief hindrance in the development of the Indian schools heretofore has been the offensive and needless intrusion into their management of partisan politics. Men, and women, too, wholly devoid of any single qualification for such work, and simply as a reward for party service, either by themselves or their friends, have been employed, and it goes without saying that such appointments have worked evil and only evil, and that some of the schools that were supposed to be for the elevation and civilization of the Indians have been useless to them and disgraceful to the Government. The criticisms made upon some of these schools and upon the men and women in charge of them by the semi-savages, for whose benefit they were supposed to be established have been very searching, scathing, and just.

During the period in which I have had the responsibility and the honor of administering the Indian Bureau, I have in no single instance dismissed an employé for political reasons, and in every case in making selections for these important positions I have made the question of fitness for the work the crucial test. I am very sure that the present hopeful condition of the schools is due very largely to this policy, and I can not too strongly urge that the one absolute condition of their future success is the application of the solitary test of fitness, and the exclusion of any and all other considerations. Any other plan of administering the school service, which is designed to embody and illustrate the Christian civilization of the most enlightened nation of the nineteenth century, and to bring the benefits of modern culture home to the North American Indians, is unworthy of the Government and of the age.

These views are clearly set forth in a new form adopted for applications for employment in the Indian school service, which will be found in appendix.

Eleventh. There is a necessity for some improvement in the matter of supplies. The Indians made at some places serious complaints regarding the quality of goods furnished to them under treaty obligations, and their criticisms are in many cases well founded. Some of the clothing and much of the machinery and agricultural implements which have been furnished them have been of a very inferior quality. They have such poor facilities for having clothing or tools repaired and the service to which they subject both is necessarily so hard, that regard for ordinary economy as well as fairness dictates that they be provided with articles of good quality, instead of those of a very inferior grade.

Of course it is desirable that proper economy should be exercised in the purchase of Indian supplies, but I submit that it is not economy to buy inferior articles. In the annual letting in New York, of contracts for supplies for the Indian service, the practice has too largely prevailed of buying the cheapest grades of goods offered. This is neither good economy nor good sense, and when applied to medicines, edged tools, agricultural machinery, and even to clothing and other articles, it is waste. Nothing should be bought for the Indians which is not

serviceable, and the cheapest in price is oftentimes the most costly. There is a most urgent necessity that the utmost care should be taken:

(1) In the matter of advertising for supplies, to have it understood that goods of good quality will be purchased in order that those who are intending to bid may not feel obliged to offer inferior articles.

(2) That the supplies selected be chosen with special reference to the uses to which they are to be put, and that only those be bought which are serviceable.

(3) That the goods delivered be equal in quality to the sample upon which the contract is awarded. It is still difficult to secure from contractors goods of a quality equal to their samples, or to the terms of their contracts. There is yet a very common notion that an Indian contract means large profits, and that there is some process by which goods inferior in quality or deficient in quantity can be thrust upon the Government for the Indians. The utmost vigilance on the part of inspectors and of agents does not, in all cases, secure the fulfillment of the spirit of the contract.

Large quantities of goods of various kinds are to be found at the different agencies which are, for one reason or another, practically useless. This has resulted in some cases from the carelessness with which agents have made requisitions for supplies, which seem to have been made often at random. It is my purpose to call upon the agents for a detailed statement of all surplus goods now in store, and to take such steps as will secure the proper disposition of them.

I am of the opinion that at no distant day the issue of rations, except, perhaps, to the aged and the sick, should be entirely discontinued. The habit of depending upon the Government for food and clothing is and must continue to be, so long as it is kept up, a source of demoralization. Although these annuities are issued to the Indians in payment of lands purchased of them, the absence of the necessity of laboring and of purchasing from the fruit of their labor their food and clothing is very harmful, especially to the younger Indians. The value of the rations should be given either in money or in some form that tends to stimulate labor, instead of discouraging it. They should be assisted to help themselves.

In very many cases the custom is still in vogue of requiring them to go long distances after their food and clothing, thus entailing an immense waste of time and encouraging a habit of vagabondism. Whole bands and families often leave their homes, their crops, and sometimes their stock, behind them and go off long distances to the agency after rations, spending a large portion of their time either on the road going and coming or at the agency feasting and dancing. It would be difficult to devise a scheme more demoralizing than this.

At some of the agencies, among them Anadarko and Darlington, the habit is still kept up of issuing living cattle, allowing the Indians to chase them over the prairie in imitation of the buffalo hunt and to shoot them in the presence of their wives and children, and amidst the howling and yelling of dogs; and then, of allowing the squaws to perform the filthy work of butchering, while the children and the dogs stand about apparently sharing in the sport. It is needless to say that this bit of barbarism is a fearful hindrance to the work of civilization. Decided reform in this respect is progressing.

Twelfth. I desire to ask attention to two matters of special concern which call for Congressional action. The first is the desirability of an early ratification of all pending agreements made with Indians and a full compliance with the terms thereof. When Indians have ceded to

the Government their lands for valuable considerations they expect that the terms of the agreement will be complied with at once, and in their ignorance of the methods of legislation they are unable to account for delay, and the progressive party of the tribe is often twitted by the non-progressive with the taunt that the Government is dealing falsely with them and that they are its dupes, and they cite the non-fulfillment of agreements in proof of the charge. There are now pending before Congress several such agreements, which I hope will receive favorable action at an early day.

The second point is that the preservation of peace and good order over the vast extent of territory now occupied by Indians can not be successfully accomplished with the present Indian police force, as it is both too small and too poorly paid. I have had occasion to give special attention to this matter, and I have found that the Indian police generally are obedient and faithful, but that they lack in interest and enthusiasm in their work because they are so poorly paid for it. They are required to furnish their own horses and perform very arduous duty, and they receive the insignificant sum of \$10 per month. The War Department has authority for the enlistment of 1,000 Indian scouts, each of whom receive \$13 per month, besides food and clothing and in addition a daily allowance for the use and feed of their horses. Our Indian policemen complain very justly of the great disparity between their pay and that of the scouts, and oftentimes they leave the employment of the agency and enter the Army simply for the sake of better pay. I see no reason whatever for making such a distinction, inasmuch as in both cases they are the servants of the same Government employed for substantially the same purpose.

I recommend therefore that the number of Indian policemen be increased, the privates from 700 to 1,000, and the officers from 70 to 100. I submit that it is better for many reasons to strengthen the Indian police than to increase the size of the Army. The police are under the immediate command of the agent; are always where they can be used when needed, and can be employed in various useful ways when their services are not required as policemen; and they are civilians whose employment inculcates obedience to civil law.

In conclusion, I wish to express to you my very grateful appreciation of the privilege which I have had of personally observing the work as it is carried on in the fields. It has given to me a fund of practical information, a personal acquaintance with the workers, an appreciation of the difficulties and perplexities of the situation, and a much coveted opportunity of viewing the efforts of the Government from the standpoint of the Indian. I shall resume the work of the office confident of an increasing ability to meet the obligations devolving upon me more fully and satisfactorily than before.

Very respectfully,

T. J. MORGAN,
Commissioner.

THE SECRETARY OF THE INTERIOR.

REPORT OF THE SUPERINTENDENT OF INDIAN SCHOOLS.

DEPARTMENT OF THE INTERIOR,
INDIAN SCHOOL SERVICE,
OFFICE OF SUPERINTENDENT,

In the Field, September 11, 1890.

SIR: The obligation to prepare my annual report comes in the midst of visitations of Indian schools and agencies on the Pacific coast. I deem it inexpedient to return to Washington, D. C., for this purpose, it being desirable to complete my work among the schools in this far off region without incurring the expense and loss of time which a trip to and from Washington would involve.

According to previous custom, the Commissioner of Indian Affairs will embody in his report the statistical data relating to the Indian schools; and therefore it seems most fitting that I should comprise in my report such matters as have come under my personal observation in the field.

During the sixteen months that have elapsed since my appointment, on the 1st of May, 1889, I have been in the field thirteen months. In this time I have visited a part of the schools in the Indian Territory; all the schools in Nebraska, except those at Santee; the Crow Agency schools, in Montana; the Nez Percé and Cœur d'Aléne schools in Idaho; all the schools in Washington, save at the Neah Bay and Colville Agencies; * all in Oregon; all in California, except at Round Valley; all but two in Arizona; nearly all in New Mexico; all in Nevada, except at Western Shoshone; and the following large industrial schools: Lincoln Institute, Carlisle, Hampton, Haskell, Chilocco, Genoa, Albuquerque, and Chemawa. This makes more than eighty schools in all, besides repeated visits to several. I have visited fifty Indian reservations, situated in twenty-three agencies; and half a dozen military reservations. Number of miles traveled in this service to September 11 is 28,340, of which 2,610 miles were by wagon. Such has been my field of observation.

When I entered this service, I resolved to hold my preconceived opinions regarding Indian matters tentatively, until such time as I should have opportunity to test them upon a more definite basis of facts. I have therefore been studying the Indian problem in the field, by personal observations and close contact with the living issues. Nor have my observations been confined to the more progressive tribes. In southern Montana, among the Pah Utes of western Nevada, all through Arizona, even to the blood-thirsty Apaches, and with the quaintly civilized but non progressive Pueblos, I have come in contact with the Indians farthest removed from our civilization. On the other hand, I have visited some of the tribes most advanced in civilization—the Omaha, Nez Percé, Yakama, Umatilla, Puyallup, Tulalip, S'Kokomish, Chehalis, Klamath, Siletz, Cœur d'Aléne, and fragments of the Digger.

As a whole, I have found the Indians of northern Idaho, Washington, and Oregon the most advanced in civilization. These Indians, so far as I can learn, have not been pauperized by rations from the Government; and I believe that many of them have been under the administration of a larger number of excellent agents who held the office for a longer term of years than have the Indians of some other sections of

* Visited later.

the country. Then there has been a larger amount of continuous Christian effort among the Indians of this region during the last sixty years than among the Indians elsewhere, except in the five civilized tribes of the Indian Territory.

The type of white population which pushed over the mountains into the Northwest section brought with it the very best elements of the civilization in the United States, very different from the Mexican civilization which penetrated and largely dominated the tribes along our southern border. While therefore among the southern Indians the prevalent variation from their own dialects is the Mexican language, the Indians of the Northwest speak much English. In the Northwest, board houses of three, four, and five rooms have taken the place of brush houses, and the old-time Indian costume has almost wholly disappeared; but only wykups, except now and then rude adobes and more rarely still timber houses, are used by the Indians of Arizona, western Nevada, and southern California. In the Northwest I found no Indians bearing firearms; and in Nevada, California, New Mexico, and Arizona also these weapons have disappeared, except among the fierce Apaches, and to a small extent among the Navajos. The deep shadows of ignorance, pagan superstition, squalor, and ultra conservatism, so painful and oppressive among the tribes of Nevada, Arizona, and New Mexico, measurably disappear as we come among the Indians of Oregon, Washington, and northern Idaho. Filthy, unkempt, ignorant, lazy, lounging Indians there are still in the Northwest, but they are rapidly falling into the minority. The Indian skies of the Northwest are many degrees brighter than those of the Southwest, but they are still flecked with clouds and mists, leaving yet much work for philanthropists and the Government.

It must be confessed that the Indians of Arizona have points of physical superiority over those beyond the Cascades. Their complexion is very dark, and they wear their long black hair unkempt and often thickly matted; but they are tall, straight, and muscular, without corpulency. How such powerful physiques have developed in the hot zone of Arizona I can not understand. They are really strong, of great endurance and agility, as is abundantly attested by railroad agents in charge of construction gangs. Mojaves and Yumas are much preferred to Italians and Irish for such labor. They are declared to be quicker and better able to endure the heat, and many of them are earning a good living by such labor, and most are eager to obtain opportunities for work. When we come to mental ability, we find the Indians of Arizona inferior to any others. The children are slow to learn, sorely taxing the patience and ingenuity of teachers; and the environments, I regret to state, do not stimulate the children to progress or the teachers to enthusiasm.

While all Indians are more or less improvident, and some in all sections recklessly so, those of Arizona, particularly the Yumas, Mojaves, Hualpais, and Apaches are the most improvident of all.

The Maricopas, living near the thrifty towns of Tempe and Phoenix, are evidently borrowing civilized methods and habits, and are learning to make more regular provision for their needs.

The Pimas, situated a little more remotely from civilized communities, are utilizing their valleys and scanty water supply for the cultivation of grain, selling yearly to the traders 6,000,000 pounds of wheat in exchange for goods. They occupy a narrow strip of land extending 40 miles along both sides of the Gila River. The high land back of the

river is arid and barren, but the soil of the valley is fertile, and, with sufficient water supply for irrigation, will support the Pimas and in part the Papagoes. I feel it my duty to call the attention of the Department to the fact that the white population near the Pima Reservation, by turning aside and storing the water supply for their own use, are imperilling the welfare of the Indians. It is greatly to be feared that soon the Indians will find themselves without even the meager supply of water which they have been accustomed for centuries to appropriate. To allow this absorption of water by the whites is a palpable violation of "the rights of eminent domain" recognized in constitutional law. It will also be a great misfortune, pauperizing these hitherto self-supporting, worthy Pimas, who derive their subsistence from the raising of horses and cattle and the cultivation of the soil. They have been farmers for centuries, raising wheat principally. White men, with all their skill, cannot live in a country like this without water for stock and for irrigation; how much less this simple people, unacquainted with art and civilization. Better leave the Pimas, in blankets and long hair, to subsist on berries, than to educate them and then take away from them their last drop of water. In that case education will create new needs which can only remain unsupplied.

The Papagoes have a very limited area of agricultural land; nothing at all adequate to their needs. The small area assigned them contiguous to Tucson on the south comprises only 2,500 acres which can be irrigated. Another small reservation for these Indians is located at Gila Bend, on the Southern Pacific Railroad. On these two reservations live from 300 to 500 Indians, a small portion of a tribe hitherto estimated at from 4,000 to 7,000 souls. The larger portion of these Papagoes roam over that part of Arizona lying south of the Southern Pacific Railroad, some of them making foraging journeys far down into Sonora, Mexico. They are self-supporting after a fashion. Those living on the reservations cultivate the soil so far as it is cultivatable; some assist the Pimas in harvesting, receiving grain for compensation; and the migratory portion raise horses and cattle. In the summer season all these classes use the fruit of the cactus plant and wild berries for food. It is a marvel how they live.

About 90 miles to the south of Tucson are two Papago villages, each with nearly thirty miserable, squalid adobe houses, with not a drop of water within many miles, except what is caught in a pool during the rainy season. In a short time the water in these pools becomes indescribably thick and vile from being the common resort of Indians, cattle, and swine. The pools soon dry, and the Indians roam into the mountains in pursuit of water for themselves and their stock. In a large area traversed by the Papagoes there is no permanent supply of water for irrigation, nor will the land furnish subsistence to appease the hunger even of the coyotes and gophers, which are barely maintaining a starving existence upon it. At this point I can not resist the assertion that the primary and principal education to be given these children, for the present, is the imparting of such knowledge as will bring new and practical arts of civilization to bear upon their sterile fields.

Much can be said in praise of this people. The women are remarkably chaste. An old prospector and miner said: "The Papago women stoutly resist the temptations of miners even when large pieces of gold are offered." The Papagoes are quite industrious, according to their opportunities, and those I saw in Tucson and vicinity were decently

dressed, with clothing usually clean and well repaired. A close observer of these Indian says :

Ultimately the Government will be compelled to gather these Indians together, give them a place to dwell, and in some way secure water, without which industry is unavailing and living is impossible in this country. As the white population fill up the Territory, the little the Indian has possessed, so far, will be taken from him, and he be left to drag out a miserable vagabondish existence or to starve.

The Moqui rank among the most staid and conservative of all Arizona Indians, and everything about them wears an antique appearance—their walled habitations on lofty cliffs, to which fuel, produce, and water are carried with great labor; their old-time customs, of which they are very tenacious; their strange pagan shrines and rites, perpetuated from times immemorial; their grotesque snake dances; their peculiar form of self-government; their repugnance to education; their jealous guarding against any modification of tribal ideas and customs; their shrinking timidity in the presence of hostile invaders; and their unchanging identity for centuries. Such are the Moqui whom we seek to assimilate to our civilization and incorporate into our national life. They live in several large communities, aggregating 2,200 people, weak in chivalry, but strong in their isolated, lofty, rocky homes. They are withal industrious, and rank among the best farmers, cultivating their low lands at great disadvantage, because so far from their habitations. Within the past two years the Moqui are being induced to build houses in the valley and live in them—the first indication of change among a hitherto unchanging people. It is hoped that this step will let in sunshine and progressive ideas which will revolutionize their tribal life.

The Navajos live mostly in Arizona; but a by no means unimportant part of the tribe occupy the northwest corner of New Mexico. On the border of the two sections a mine of gold and silver of remarkable promise and a huge vein of coal, much like the Lehigh of Pennsylvania, have been recently discovered. These Navajos are estimated variously at from 16,000 to 22,000, and have flocks and herds which approximate 1,100,000. The number of these Indians has probably been exaggerated. They have a large reservation, much of it being mountainous and arid, producing little feed for flocks; and, very naturally, this people are extending beyond the reservation borders, taking up claims and settling in unoccupied valleys north of Gallup and Manuelito. The Navajos, hitherto very nomadic, are becoming stationary. Two hundred houses were reported by the police as in process of building at the time of my visit last May. The Navajos are devoting more attention to agriculture, but are very conservative in regard to education.

Altogether this is the largest and most powerful aboriginal tribe I have seen, not merely numerically, but also in respect to mental acuteness, sagacity, and physical prowess. It is certain that the Government must manage this tribe wisely and effectively, or it may become an element of trouble not easily controlled. Under recent experiences they have become and are now tractable, improving in harmony and the arts of civilization; but the latter they are gaining slowly. Schools and Christian missions in their midst will be helpful and hopeful factors.

The Pueblo Indians of New Mexico retain a very unique type of the olden time civilization. One goes from pueblo to pueblo looking in vain for any variation. In habitations, in social life, in dress, in methods of agriculture, in forms of internal organization, in religious notions, in relation to the state, and in current ideas, the nineteen pueblos are essentially the same. The chief difference is in population, which ranges

from 18 in the smallest to 1,547 in the largest. The total area of these pueblos aggregates more than 900,000 acres; and the land of each pueblo is held in common, under patents granted by former civil governments. These pueblos are situated almost entirely in the valley of the Rio Grande, from which, through irrigating ditches constructed by former generations, water is distributed over large areas. Crops are raised in common, but there is some personal ownership of flocks, and a few people become wealthy. In most of the pueblos a supply of grain is held in store to meet the emergency of a possible famine.

Their houses are piles of adobe, built against and upon each other and entered from above by ladders, up and down which all household stores are carried. In these ramparts of squalor, with little light and slight ventilation, and with the retained germs of frequent infectious diseases, a long succession of families have lived for centuries. The conservatism of these Pueblo Indians is too deep and radical to be easily estimated. They are jealous beyond measure of any change in dress, modes of living, methods of husbandry, religion, government, and ideas; and they concentrate an amount of opposition against actual or suggested modifications which it is impossible to weigh. While yielding obedience to the Roman Catholic Church for the most part, they still retain the ancient pagan religion and maintain the old pagan shrines. They are a peaceable, quiet people, of fair average morals, and tolerably industrious during the agricultural season. Having light complexion and slight physiques, they are not robust like the Indians of Arizona, and are probably diminishing in number. As the Pueblos are now constituted, they furnish the most difficult but one of the most important fields for educational work in all this southern country.

The Mescalero and Jicarilla Apaches are in New Mexico. The former number less than 500, and the latter are even fewer. The reservation of the former, with nearly 500,000 acres, has only about 4,000 of tillable land, and of this only 245 acres are reported as actually cultivated by Indians. It is not surprising, therefore, that 80 per cent. of their subsistence comes from Government rations. The Jicarilla Apaches, in the extreme north of the Territory, exhibit an inborn thrift by their successful farming and the erection of a large number of houses. Both these branches of the Apache tribe, though quite wild, and not fully adopting citizens' costume, possess more real vigor than the Pueblos.

All these Indians are slowly but steadily emerging from the hostile and almost chaotic conditions through which they passed during the wars in the earlier part of the last decade.

My observations of the Nevada Indians were confined to the western part of the State, among the Pah Utes of Pyramid Lake and Walker River Reservations, and among the Washoes hanging upon the skirts of villages. The latter, living in the poorest wykiups I have seen, are roving and dissolute in their habits. About two-thirds of the Pah Utes can speak considerable English, and the tribe receives only 12 per cent. of its subsistence from Government. In these two western reservations are 641,815 acres, of which only 7,500 is reported as tillable and 1,550 as actually cultivated by Indians, or about $1\frac{1}{2}$ acres per capita. These Indians are slowly beginning to raise cattle; their great lakes, abounding with an almost inexhaustible supply of game fish, which furnish excellent food and means for obtaining money, are a temptation to neglect husbandry. The Pah Utes cling to their old-time superstitions, shift their residences with the seasons, in pursuit of berries and

game, and do not appreciate education. It should be added that Nevada as a whole does not furnish strong inducements for agriculture to any class of people.

The most distinctively aboriginal population of California is known as the Mission Indians, who live in San Diego County. Until recently they were supposed to be dwindling in number, but of late it is thought they are increasing a very little and now number about 3,000. They dress in citizens' clothes, are fairly industrious, though working at great disadvantage. Being docile in habit, they suffer much from the intrusions upon their land by Mexicans and whites, who drive these Indians from the fertile valleys into the surrounding foothills. Numerous are the cases in which, after cultivating tempting fields for many years, they have been obliged to abandon such property and take refuge on barren hills, all because of the greedy white and his superior craft. Vexing and pending questions in regard to claims and boundaries, disturb the life, depress the ambition, hinder the agricultural and social progress, and destroy the interest of these Indians in educational matters. When will the Government help to settle such questions? The paternal office of the Government in this matter is indispensable, because of the simplicity and childlike dependence of the Mission Indians, notwithstanding a century of contact with white civilization.

There is a certain class of persons through all this western country who seem possessed with a mania for grabbing Indian lands. It matters little what the land, it may be the snow-crowned summit or the rock-strown side of a dreary mountain, but if it has been set apart for Indians, white men immediately begin "jumping" it. Neither does it matter how many good farms are still on the market, there are men who begrudge any land set apart for Indians by treaty, and who are perpetually contriving to obtain such land.

The Indians of California who live between San Bernardino on the south and Round Valley and Redding on the north, are known, with few exceptions, by the general name of Diggers; but the Digger Indians are of very diverse classes. The lowest and most abject portions, or the typical Digger, live in the vicinity of the Sierra Nevada Mountains, and subsist chiefly on nuts, roots, yellow jackets, fish, and berries. They are few in number, quiet and retiring in disposition, and shun our civilization.

The other Digger Indians, whom I met in considerable numbers north of Sacramento, are a credit to any tribe. They represent thrift, enterprise, business ability, and a fair amount of property. They live at rancherias near white populations, with whom they mingle creditably; they speak English freely, and desire the education of their children. They are among the very best Indians I have met, and can not long be denied citizenship.

In the northern part of California are other Indians deserving of mention. In the northeast are mixed classes of the Snake and Pitt River type with a fusion of Modocs and Klamaths, who have always been self-supporting. They are very desirous for having their children educated and taught "white men's ways." A very interesting memorial asking for these advantages was recently forwarded to the President of the United States. It is a question whether there are a sufficient number, in any one community, to make it practicable for the Government to do much for them educationally, save through the public schools.

In the northwest, between the Southern Pacific Railroad and the coast, and from the south Oregon line to the Klamath River, are about

1,900 Indians, called Klamath River Indians. In Hoopa Valley, on the Trinity River, a branch of the Klamath, are 470 more. These two communities bear essentially the same characteristics. The Hoopas have a formally set apart reservation, but the Klamath River Indians occupy a region never designated as a reservation. Twenty years ago (see Report of Commissioner of Indian Affairs, 1870, p. 81) it was reported that from the mouth of the Trinity River, where it enters into the Klamath River, to the coast, a distance of 45 miles, there were 32 Indian villages, with a population of 2,400, having 340 houses. By such long occupancy and quiet, loyal conduct, have they not gained the right to have this region formally set apart for them as a reservation? They are physically a good type of Indian, vigorous, self-supporting, and in some degree progressive, but nothing has been done for their education.

The Nez Percé, Coeur d'Alène, Umatilla, Walla Walla, and Yakama tribes are agricultural and stock-raising people. When we say that a goodly number in each of these tribes are in well-to-do circumstances, single Indians owning hundreds of cattle and raising thousands of bushels of grain annually, we do not wish to be understood as saying there are not shiftless, lazy, vicious, drinking Indians; but as a whole these tribes represent very wholesome and encouraging progress toward civilization. They maintain churches, adopt our marriage customs, and observe the rights of property more carefully than too many white people around them.

Almost the same words said in the previous paragraph may be applied fittingly to the Indians of the Klamath and Siletz Agencies. Even the Modocs and the Snakes a little time ago regarded as fierce and untractable, are becoming among the most quiet and orderly of Indians. At Yainax some of them have large fields and flocks.

The Indians of the Puget Sound, though of many different tribes, impressed me as being much alike. They are shorter in stature than most other Indians and lighter of complexion, bearing a decided Mongolian type. Most of them have received their lands in severalty, though in many cases the patents are not issued. The region in which they live does not afford so good opportunities for agriculture as many other parts of the country; nevertheless all these Indians raise some crops and cattle, supplementing these gains by hop picking, salmon fishing, and logging, and they live quite comfortably. As they appear around the towns, some are squalid, but most are rapidly improving their personal appearance as well as their home and social life. Their houses are built of lumber and tolerably supplied with furniture. These Indians are learning to compete with white men in trade. Most localities are favored with church and pastoral services, and many Indians show the good effects therefrom. Of course there are drunken Indians, to the shame of white men be it said, who by depraved arts appeal to the peculiar susceptibility of the Indian to drink; and no people are so quickly and fatally demoralized by liquor as Indians.

The Crows of Montana whom I visited early in the year, are a large tribe of about 2,500, scattered over an immense reservation, only exceeded in extent by that of the Navajos. Of this vast area, only four-hundredths of one per cent. is tillable, and hitherto only one-half of that has been cultivated by Indians; and on those vast untillable lands the attention of the Indians has been given to stock raising. Sixty-three per cent. of the subsistence of these Indians still comes from the Government, and they are very unwilling to adopt the customs of civilized life; only one-eighth of them live in houses, and about the same proportion

dress in citizen's costume. They practice polygamy, retain the darkest superstitions, are very unchaste, and fearfully addicted to abortions. Under the able management of a strong agent, and the overawing influence of Fort Custer, this tribe though possessing much of the old-time ferocity, is quite orderly and tractable. The Crows have a strong dislike to civilization and education, and the process of bringing their children into the schools is very slow.

DECLINE OF INDIAN POPULATIONS.

In studying the field through which I have traveled I am led to inquire regarding the prospective needs of the Indians in regard to education. The future outlays of Government, in founding new schools and enlarging those now in existence, must be determined in part, at least, by the increase or decrease of the Indian population as a whole and in specific localities. If the Indian population of the country is rapidly diminishing, of course it will affect in a short time the educational work of the Government; or if it is diminishing only in some localities it will affect the question of the size and nature of the schools in said localities.

It is too soon to examine this question in its largest scope, for the needful data are not yet ready. And when the Indian census for the whole country is completed I am satisfied that comparisons with former periods, save in some localities, will be unsatisfactory, owing to the random estimates of the Indian populations by some former census takers.

I have examined the census of the present year so far as obtained and given to me by the Indian agents, and compared it with those of former periods. Having made a special study of the census for Oregon and Washington, I ask attention to the following exhibits of the Indians in those two States:

OREGON.

Agencies.	1870.	1880.	1890.
Grand Ronde.....	1, 100	860	379
Klamath.....	4, 000	1, 023	835
Siletz.....	2, 300		
Alsea.....	506	1, 109	571
Umatilla.....	850	910	999
Warm Springs.....	1, 025	554	923
Scattering Indians on rivers.....	1, 200	800	600
Total.....	10, 975	5, 263	4, 307

Some persons well acquainted with Indians in Oregon think that the 4,000 for Klamath, the 2,300 for Siletz, and the 1,200 on the Columbia and other rivers, are fabulous numbers for 1870. Later inquiries, however, have led to the conclusion that the 2,300 for Siletz and the 500 for Alsea in 1870 are not far from correct. This is the opinion of General Benjamin Simpson, who for eight years at and near that time, had the charge of the Indians at Siletz. The numbers for Umatilla appear consistent; and those for Warm Springs in 1870 and 1890, but those for 1880 are certainly faulty. The only figures for 1870 about which I am in doubt are the 4,000 for Klamath. Those on the rivers were probably about correct at that time.

By actual enumeration this year the Indians at The Dalles, The Locks,

and at Celio, covering a distance of 60 miles along the Oregon side of the Columbia River are found to be 128. I found no person who believes there are now over 300 Indians on the Oregon side of the Columbia from its mouth upwards. There are some Indians on Rogue River and on the coast. Probably 600 will comprise all the river Indians.

WASHINGTON AND NORTHWESTERN IDAHO.

The statistics of the number of Indians in Washington for two periods, 1870 and 1890, are the most satisfactory of any I have found. Those for 1870 are taken from the report of the Commissioner of Indian Affairs for 1870, pages 16 to 18, as reported to the office by Col. Samuel Ross, superintendent of Indian affairs in Washington Territory. From reading the entire report of that gentleman, pages 16 to 30, it appears that unusual care was taken in collecting and preparing the statistics, much more care than in the preparation of some other statistics of Indians reported that year.

From personal inquiries made of the Indian agents in every one of the reservations in Washington, I have come to regard the census for 1890 as very reliable. Of the census for 1880 I can not speak. I give below a table carefully prepared, showing the decrease from 1870 to 1890. It should be added that the classification of the Indians in 1870 was very different from that of the two other periods, and also that the Cœur d'Alenes of northern Idaho are included each time, being a part of the Colville Agency. The Nez Percés are also included in the table because, since 1870, some of that tribe have been transferred to the Colville Agency. This will make the comparison equitable through the different periods. The area included in the table is the region west of the Rocky Mountains and north of Oregon.

Agencies.	1870.	1880.	1890.
Puyallup.....		2,770	1,830
Tulalip.....		2,698	1,212
Noah Bay.....		1,038	426
Colville.....	16,256	3,503	3,201
Scattering.....			400
Moses' Band.....		*150	
Yakama.....		3,930	1,424
Yakama off Reservation.....			12,000
Nez Percés.....	2,703	1,206	1,715
Total.....	19,079	15,479	12,487

* Formerly included in Columbia Reservation, now with the Neapolina in the Colville agency.

Reported in 1828 and 1889 at 2,000, but number doubtful. "Yakamas off the Reservation" were probably included in statistics for 1870 and 1880.

We have in this table a striking exhibit of decline. Since 1880 only one tribe seems to have increased—the Nez Percés.

In the above for 1870, are a few Indians whose number for 1890, I have been unable to learn, viz, the Nooksacks, Skagit River Indians and San Juan Indians. The first of these are nearly all full bloods, the last are mixed to the furthest degree.

The decline of the Indian population, west of the Cascades, along Puget Sound and the coast, has been even greater.

Oregon and Washington Indians, west of the Cascades.

Agencies.	1870.	1890.
North of the Columbia River in Washington :		
Puyallup	3, 164	1, 830
Neah Bay	592	696
Tulalip	2, 275	1, 212
Total	6, 231	3, 738
South of the Columbia River in Oregon :		
Siletz	2, 300	571
Alesea	500	
Grand Ronde	1, 100	379
Total	3, 900	950
Aggregate	10, 131	4, 688

In the statistics for the Tulalip Agency for 1870, given above, I have reckoned out seven tribes which Agent Talbot says are not now within his agency, viz, Nooksack, Skagit River, etc., and consequently not included in the statistics of 1890. Five tribes included in the Tulalip Agency in 1870, Agent Talbot says, have disappeared entirely. These I have allowed still in the figures for 1870, presuming they are absorbed in other tribes whose statistics are reported for 1890.

It is evident that care should be exercised against too large expenditures for new schools in this northwest section. It is important to study each locality discriminatively and continue to improve the school buildings already erected.

THE FIELDS SCRUTINIZED.

I propose now to look closely at the aforementioned fields and show where are the greatest educational needs, to what extent they are supplied by existing schools, and how far the Indian children of school age are being drawn into these schools. This will show the localities where the largest expenditures should be made.

The agencies and reservations in the State of Washington will be examined first.

The Puyallup Agency.

Reservations.	Total Indian population, 1890.	20 per cent. reckoned to be of school age.	Number on the reservation, 1890.	20 per cent. reckoned to be of school age.	Pupils in school.			Total pupils.
					In reservation schools.	In St. George's Roman Catholic school.	In Chemawa school.	
Chehalis	148	29	135	27	30	3	4	37
Nisqually	94	19	94	19	13	10	6	29
Puyallup	611	123	611	123	95	23	16	134
Quinalt	312	62	228	45	30			30
S'Klallams	345	69			47			47
S'Kokomiah	191	38	191	38	24	5	1	30
Squacksons	128	25	60	12	6			6
Total	1, 830	365	1, 319	333	245	41	27	313

The capacity of the Indian school buildings, including the St. George's Roman Catholic contract school, two day schools at Port Gambel and Jamestown, and making no account of sending to Chemawa, is 405, with 365 pupils at the highest rate of reckoning, and an actual enrollment of 313.

The Tulalip Agency.

Reservations.	Total Indian population, 1896.	Children between 6 and 16 years.	Pupils in Tulalip school.	Pupils in St. George's Roman Catholic contract school.	Pupils in Chemawa school.	Total pupils in school.
Snodgrass *	447	64	66	6		72
Lummi †	194	71	30		1	31
Swinemah	227	42	13			13
Madiup	144	29	7	1	6	14
Musakloot	180	77		11		11
Total	1,212	283	197	18	7	222

* *De Tulalip.*

† A day school has been started lately on this reservation, with accommodations ample for all the remainder of the children of this tribe.

‡ Last fiscal year this school sometimes enrolled 126 pupils.

The capacity of the school buildings in this agency, aside from the day-school building at Lummi, is 190. Allowing some pupils to go to St. George's, near Puyallup, and others to go to Chemawa, the children at this agency may be regarded as well provided for. The late agent, Mr. Talbot, writes: "You can safely estimate that 50 will not attend any school, or at least they can never be found when school is in session." Mr. Talbot speaks from a large experience in trying to draw the children into school. It is to be hoped that the actual enrollment will rise considerably above the present number—only half of those of school age.

Neah Bay Agency.

Reservations.	Total population, 1896.	Children between 6 and 16 years.	Pupils in schools.
Makah	214	93	85
Quillabate	261	14	144
Total	565	127	110

* Ten of these are diseased, blind, or in some way unfit to be in school. According to the Indian Bureau method of reckoning 20 per cent. of the total Indian population as children of school age, the Makah tribe should have 90 school children; but an examination of their census shows that the average number of persons in the families of this tribe is only 2.8 each.

† A day school which sadly needs a good building. It is among very worthy Indians and in the hands of excellent teachers.

Yakama Agency.

	Total Indian population.	Children between 6 and 16 reported.	20 per cent. of population.	Pupils in school.			Total pupils.
				Reservation school.	Roman Catholic contract school, North Yakama.	Chemawa school.	
Yakama, Klickitat, etc.	1,428	200	284	167	730	8	168

* I am quite certain this number is too low, and only an estimate.

† Not half as many as a few years ago. The school building burned in April 1896, and owing to many delays the new building is not yet ready. Hence diminution.

‡ Reported to me as having come from the Yakama Reservation.

The capacity of the Government school when the new edifice is completed will be 150, and the contract school at North Yakama accommodates 65, making 215. This is one of the reservations where there needs to be put forth greater efforts to bring the Indian children into the schools.

Colville Agency.

Reservation and scattering Indians.	Total Indian population, 1890.	Children between 6 and 16 years.	Pupils Colville Roman Catholic contract school.	Pupils Cœur d'Aléne Roman Catholic contract school.	Pupils in Chemawa school.	Total pupils.
Cœur d'Alénes	422	54	.....	72	.....	72
Lower Spokanes	417	66	.....	.....	.....	.....
Lakes	303	91	.....	.....	.....	.....
Colvilles	247	44	58	.....	.....	58
Okonagans	374	69	26	.....	.....	26
Moses' band of Columbia	443	66	.....	.....	2	2
Joseph's band of Nez Percés	148	11	.....	.....	.....	.....
Nespelems	67	16	.....	.....	.....	.....
San Puells	350	80	2	.....	.....	3
Off reservation:						
Callispels	240	*40	1	1	.....	2
Upper Spokanes	190	*20	.....	5	.....	5
West of Okonagan River	*300	*60	.....	.....	.....	.....
Kootenais, northeast of Colville	*100	*20	.....	.....	.....	.....
Total	3,601	*607	87	78	2	167

* Estimated by Agent Cole.

† Probably should be larger.

Here are 607 children under or near the jurisdiction of the Colville Agency. According to Government method of computation there should be 720. The attendance in all the schools last year was 167 pupils. The Okonagan and Nespelem schools were not opened till September of 1890. The four Roman Catholic contract schools at Colville and at Cœur d'Aléne have had an enrollment of 165 during the past fiscal year. The capacity of these schools is somewhat greater, but they are intended to accommodate white pupils in part.

A good boarding school located on the Lower Spokane Reservation near the agency, with capacity for 150 pupils, is a desideratum, and the Nespelem school should be converted into a boarding school with enlarged capacity.

Moreover these tribes are increasing in population, the births last year being 223 to 117 deaths. Such indications of large relative increase are not common among Indian tribes. This statement applies only to the reservation Indians.

Grand Ronde Agency.

	Total Indian population, 1890.	Children between 6 and 16 years.	Pupils in the reservation schools.	Pupils in Chemawa school.	Total pupils.
Grand Ronde and other tribes	379	76	65	1	66

It is evident there needs to be no enlargement of school accommodations on this reservation. The building occupied by the boys, however, should be made more comfortable and an addition made for a boys' sitting room.

Siletz Agency.

	Total Indian popula- tion, 1890.	Children between 6 and 16 years.	Pupils in reserva- tion school.	Pupils in Chemawa school.	Total pupils.
Tribes of Siletz Reservation	571	106	65	11	76

Since the latest published statistics the capacity of the home school has been enlarged so that about 85 pupils can be accommodated. During the present autumn the attendance at the reservation school has been increased and a larger number sent to Chemawa, so that all the children are now well provided with school facilities.

Klamath Agency.

	Total Indian popula- tion, 1890.	Children between 6 and 16 years.	Pupils in reserva- tion school.	Pupils in Chemawa school.	Total pupils.
Klamath	{ 904 }	{ 180 }	{ 113 }	{ 20 }	{ 200 }
Yainax					
Total	904	180	103	5	108

The dormitory capacity of these two school buildings is ample, but there should be a new building for recitations, assemblies, etc., at Klamath and an enlargement at Yainax for a boys' sitting room.

Warm Springs Agency.

	Total Indian popula- tion, 1890.	Children between 6 and 16 years.	Pupils in reserva- tion school.	Pupils in Chemawa school.	Total pupils.
Warm Springs and Sinemasho	923	176	135	13	148

The number of children of school age reported is almost up to the number obtained by the Government method of computation. The families on this reservation average 3.2 persons in each. One hundred and forty-two Indians are over fifty years of age and thirty-four over seventy years.

Since the erection of the new addition to the Sinemasho school, the two buildings will accommodate 150 pupils. These, with some sent to Chemawa, comprise the whole. These school buildings very much need a generous outlay for improvements, and the Indians upon this reservation deserve this attention.

Umatilla Agency.

Tribes.	Total Indian popula- tion, 1890.	Child- ren be- tween 6 and 16 years.	Pupils in Gov- ernment reserva- tion school.	Pupils in Roman Catho- lic Umatilla school.	Pupils in Cœur d'Alène schools.	Pupils in Che- mawa school.	Total pupils.
Umatillas, Cuyunee, and Walla Walla	929	198	*75	15	5	5	100

* The past year was a broken one, on account of the necessity of moving the school out of a dilapidated, dangerous house. A larger attendance may soon be expected.

The capacity of the two new buildings just completed for the Government school will be more than 150 pupils, which will accommodate all children who do not attend either Chemawa or the Roman Catholic schools.

Nez Percé Agency.

	Total Indian population, 1890.	Children between 6 and 16 years.	Pupils in reservation school.	Pupils in Cour d'Aléne schools.	Pupils in Chemawa school.	Total pupils.
Nez Percés	1,715	347	125	19	8	152

From the above statements it appears that there are 195 children of school age on this reservation not yet gathered into any Indian school. In the school buildings already on the reservation there is room for 100 more pupils, or at least with a small outlay this additional number can be accommodated. Since the present year opened Carlisle has received a dozen or more pupils from this reservation.

The Pueblos of New Mexico.

Pueblos.	Total population in 1890.	Children school age.	Pupils enrolled in the schools.									Total pupils.
			In day schools.			In boarding schools.						
			Roman Catholic.	Presbyterian school.	Government school.	Albuquerque Gov- ernment school.	Albuquerque Pres- byterian school.	Bernalillo school.	St. Catherine's school, Santa Fe.	Ramona school, Santa Fe.	Carlisle.	
Isleta.....	1,007	221	49	47	.....	47	3	32	22	.....	1	201
Zuni.....	1,547	473	.....	12	.....	.....	.....	.....	.....	.....	.....	12
San Juan.....	374	69	42	.....	.....	.....	.....	.....	6	.....	.....	48
Laguna.....	963	228	29	53	30	40	48	.....	.....	.....	107	*307
Picuris.....	91	16	.....	.....	.....	.....	.....	.....	.....	2	.....	2
Santa Clara.....	204	47	.....	.....	.....	6	1	1	1	.....	.....	9
San Il Defonso.....	151	27	.....	.....	.....	.....	.....	.....	4	.....	.....	4
Taos.....	382	97	37	.....	.....	3	.....	.....	4	.....	1	44
Acoma.....	597	154	45	.....	.....	10	.....	.....	4	.....	13	68
Pojoaque.....	19	2	.....	.....	.....	4	.....	.....	.....	.....	1	5
Teanque.....	102	20	.....	.....	.....	.....	.....	.....	4	.....	.....	4
Cocheti.....	285	102	.....	.....	.....	20	.....	.....	5	.....	.....	35
Nambe.....	86	19	.....	.....	.....	.....	1	4	1	2	.....	8
Jemez.....	483	134	30	57	.....	4	.....	.....	3	.....	1	95
Zia.....	110	27	.....	.....	.....	4	.....	.....	.....	.....	.....	.....
San Felipe.....	499	106	.....	.....	.....	.....	.....	.....	.....	.....	2	6
Santa Ana.....	271	79	.....	.....	.....	11	.....	.....	.....	.....	.....	11
Santo Domingo.....	960	203	37	.....	.....	.....	.....	.....	.....	.....	.....	37
Sandia.....	145	36	.....	.....	.....	6	.....	11	.....	.....	.....	17
Total.....	8,285	2,050	269	169	30	151	53	53	50	4	131	913

*Probably the day schools contain some pupils under six years and the boarding schools some over sixteen.

The number of children of school age furnished from the agency census for 1890, viz, 2,050, is considerably more than the 20 per cent. of the estimate of the Government Bureau, viz, 1,656.

For the above 2,050 children of school age, the following provisions already exist:

Government schools (boarding):		
Albuquerque	250	
Santa Fe (new)	234	
		484
Contract boarding:		
Presbyterian, Albuquerque	125	
Roman Catholic, Peraltillo	75	
Congregational, Santa Fe	24	
Roman Catholic, Santa Fe	123	
		347
Contract day	67	
Government day	2	
Total		1,549

But the above accommodations are shared by 208 pupils from Arizona, Mescalero, and Jicarilla Apaches, and Navajos, etc., reducing the 1,549 to 1,332. The Mescalero and Jicarilla Apaches, both numbering about 700, are not included in the above statistics. The former have a school; and only 20 pupils from these two tribes are reckoned in the 208 above mentioned. The Pueblo Indians present indeed a needful field, but one of the most difficult fields to cultivate, owing to their determined resistance to education.

Northern California.

	Total Indian popula- tion, 1890.	Children of school age.	Pupils in three reserva- tion day schools.	Pupils in four Roman Catholic contract schools.	Capacity of school buildings.
Round Valley	683	65	71		70
Hoopa Valley	470	80	45		66
Klamath River	11,200	380			
Digger Indians				166	175

* Attendance could be increased by making this a boarding school. It is difficult for a part of the pupils to attend the school daily because of having to cross the Trinity River, which runs through the reservation lengthwise.

In the region of the Lower Klamath and Smith Rivers are 1,900 Indians, a well-developed and self-reliant people, who have no school accommodations. By removing the military, no longer needed from Hoopa Valley, that post could be turned into a boarding school for the Hoopa Valley and Klamath River Indians, a very desirable move. This is a large and, with the military removed, will be a very important field for educational work.

In northwestern California are bodies of Digger Indians, living on ranches not far from cities and villages, among whom the Roman Catholics have four day schools—at Ukiah, Hopland, and two near Lake Port. These Indians are found all through Mendocino, Lake, and other contiguous counties. They are among the best Indians I have seen and should not be estimated on a low scale because of the reproachful name Digger. A considerable number is found at Manchester and also at Upper Lake who are calling for day schools. The \$10 per quarter offered by the Indian Bureau to pay for their education in the public schools is at present their only recourse.

In Northeastern California, beyond Redding, are Indians calling for schools. There are supposed to be nearly 7,000 Indians in California not on reservations.

Mission Indians in southern California.

Tribes.	Total Indian popula- tion.	Children between 6 and 16 years.	Pupils in Govern- ment day schools.	Pupils in San Diego Roman Catholic contract school.	Total pupils.
<i>On reservations.</i>					
1. Morongo	208		43		43
2. Sanaha	157		25		25
3. Comintilla	276		25	1	26
4. Temecula	139		34	9	43
5. Pala	79			2	2
6. San Luis Rey	186		25	10	35
7. Pictre	167		25		25
8. Capitan Grande	67				
9. Syonan	35			4	4

Mission Indians in southern California—Continued.

Tribe.	Total Indian population.	Children between 6 and 16 years.	Pupils in Government day schools.	Pupils in San Diego Roman Catholic contract school.	Total pupils.
<i>On reservations—Continued.</i>					
10. Mesa Grande	178		26		26
11. Cosmit	45				
12. Inija	32				
13. San Ignacio	74				
14. San Isidore	53				
Total	1,721				
<i>Not on reservations.</i>					
1. Agua Caliente	156		35		35
2. Pauma	83				
3. San Felipe	100				
4. Santa Isabel	136				
5. Matajney	29				
6. Porte La Cruz	19				
7. San Juan	24				
8. Twenty-nine Palms	21				
9. Campo	42				
10. Long Canyon	58				
11. La Pasta	29				
12. La Puerta	18				
13. Santa Manuel	37				
14. Mancinitas	46				
15. San Luis Rey, or Old Mission	65				
16. Santa Rosa	25				
17. Laguna	30				
Total	924				
Other mission Indians beyond Banning on the border of the "Desert," who refuse to be counted	250			*22	22
Aggregate	2,895	867	265	51	321

* From other scattering points.

The foregoing statistics furnished me by the agency clerk at Colton, and by the reverend superintendent of the San Diego Roman Catholic Contract School, show the character and extent of the educational field among the Mission Indians. They number 2,895. At the Government method of calculation there should be 578 children of school age, but the figures sent me say 867, or nearly 300 more, which is certainly exceptional among Indians if the statistics are correct. But only 321 have been provided with education the past year. The new contract industrial school at Banning and the other planned to be started at Paris will help to meet the needs. There is certainly little encouragement to open more day schools, the local populations are so small. I have given each in detail in the table for the purpose of showing that boarding-schools are needed if we would meet the case.

THE YUMAS IN CALIFORNIA.

These Indians, about a quarter of whom may be found in Arizona in certain seasons of the year, have been reported as numbering 1,118, though I have been unable to get the figures for this year. The number of children of school age is not far from 225 and the actual attendance has ranged from 100 to 130, but there are accommodations for a larger number in the Government school buildings.

ARIZONA.

Navajo Agency.

	Total Indian population.	Children between 6 and 16 years.	Pupils in reservation schools.	Pupils in Albuquerque Government school.	Pupils in Grand Junction school.	Pupils at Carlisle.	Total in school.
Navajos	*15,000	3,400	97	0	31	4	132
Mojaves	*2,500	440	14				14
Total	17,500	3,840	111	0	31	4	152

* Estimated by the Indian Agent, who writes that no census for 1890 has been taken. They have been estimated, in past years, at from 15,000 to 22,000. They have wandered so widely with their numerous bands that it has been difficult to obtain an accurate census. All who know them well agree that the Navajos are steadily increasing, and are one of the most thrifty tribes of the American Indians.

In this agency is the largest field for the outlay of money for Indian education by the Government—3,440 children of school age, with only 152 in attendance, last year, in all schools. The accommodations have been recently enlarged at Fort Defiance, but it is doubtful whether over 200 pupils can find room in the present buildings at both the latter place and at Keam's Cañon. Within the next two years several large school buildings should be erected within the Moquis and Navajo reservations.

San Carlos Agency.

	Total Indian population.	Children between 6 and 16 years.	Pupils in reservation school.	Pupils in Carlisle.	Total pupils.
San Carlos and White Mountain Apaches, and portions of Yuma and Mojave Indians	*4,000	800	97	115	212

* About.

In the school buildings at San Carlos there are accommodations for only about 50 pupils, and even those buildings are miserable structures and some of them have been condemned as unsafe. During the past year the boys have been lodged in tents, for the want of other room. The attention of the Apaches is now more than ever turned to the education of their children. It is proposed by the Department to expend \$12,000 in school buildings this year—too little by far. It is hoped that the school accommodations, now contemplated, will be speedily provided; and, within the next two years, they should be enlarged to 400 at least.

Pima Agency.

	Total Indian population.	Children between 6 and 16 years.	Pupils in the reservation school.	Pupils in the Presbyterian school at Tucson.	Pupils in Presbyterian school at Albuquerque.	Pupils in Government school at Albuquerque.	Total pupils in school.
Pimas	4,814	1,092	117	} 77	{ 22	123	.....
Papagos	*3,363	†672	.....			10	
Total	8,177	1,764	117	77	24	133	232

* Agent Cronan writes, "The statistics of the Papagos are estimated. This was necessary, as it was impossible to take a census of that tribe, except the 363 Indians living on the reservation at San Xavier. Special census agents have, however, placed the estimate from 1,000 to 3,000 higher than mine."

† Calculated at 20 per cent. on 3,363, a low number.

The Government school at Sacaton has just been rebuilt and enlarged, but it can now accommodate but few more than 117. The Presbyterian school at Tucson has been enlarged so as to accommodate 150 pupils. Allowing the same schools to draw pupils from these tribes as in the past, with the added capacity of the school buildings, there are accommodations for not over 450 pupils, or one-quarter of the children of school age. This is, therefore, one of the large needy fields.

Colorado River Agency.

	Total Indian popula- tion.	Children between 6 and 10 years.	Pupils in reser- vation school.
Mojaves on reservation	*640	*111	69
Chimehuevis	*200	140	.....
Mojaves at the Needles	*607	133	.....
Mojaves at Fort Mojave	*410	182	.....
Hualpais	*700	140	.....
Total	2,617	506	69

* Figures given by Agent Allen.

† Calculation on the basis of 20 per cent.

The agent writes: "The Chimehuevis, Mojaves at the Needles, Fort Mojave, and the Hualpais are estimated. They properly belong to this agency, but have been off the reservation for several years."

The capacity of the Colorado River Agency School is only about 60. Here, therefore, is a great field. The new school, just opened at Fort Mojave, will help to meet the needs, but there is still occasion for another school.

In Arizona we find the greatest needs for Indian education. The Indian population of this Territory, heretofore estimated at about 35,000, as given in the foregoing tables foots up at 31,594, with the probability that it is somewhat larger. The school population is 6,480, and the number of pupils actually in schools the last year, including those drawn to Albuquerque and Grand Junction, was only 786—and this number is not far from the measure of the total capacity of school accommodations for the Indians of Arizona.

INDIAN YOUTH OVER SIXTEEN YEARS.

The school age designated by Government for Indian pupils is between six and sixteen years, but there are many others older than sixteen years who could and should be in some school. The practice is to welcome and retain these pupils till twenty years and even longer. Some of these older pupils begin their school days very late in life, and often come feeling it is their last chance for such benefits. They are usually dutiful and show a great interest in the school lessons and especially in the arts of industry. Ample provision should be made for all pupils of this class who can be induced to attend the schools.

I think it will be safe to add another hundred to every five hundred, computed on the basis of 20 per cent., for these young Indians over sixteen years who will be benefited by spending some months every year in the reservation schools or by going for a longer period to the large industrial training schools.

There can be no question but that many children under six years of age could be advantageously admitted to the Indian schools. I have

seen a few, and they have been among the most interesting and promising of the pupils in the school. Especially will this plan be helpful among tribes where no English is spoken at the homes.

RESERVATION SCHOOLS.

The functions of my office being to inspect and report, with criticisms and recommendations, I have aimed to make the scope of my investigations as broad and practical as possible. Keeping almost constantly in the field, I have visited nearly all the larger training schools, many contract and day schools, but have given especial attention to reservation schools, because they present the primary phases of the Indian problem. As before stated, my preconceptions of the Indian question, formed in the East, I have tentatively held in abeyance while studying the problem in the field. In this personal contact with the living issues I have found a more definite basis of facts on which to form opinions and hope thus to develop common-sense views on Indian affairs.

The needs of the reservations press heavily upon my mind, having viewed them face to face. The question is what educational provisions will promote most effectively the objects sought in the Indian Service.

The deportation of pupils from the reservations to the great training schools is one of the prominent measures widely attracting public attention. This class of schools has done much good, and will continue to render valuable services. They should still be fostered and made as effective as possible. As object lessons, close at hand, they keep our older population located at a distance from the reservations in touch and sympathy with the Indian work. They also introduce many educated young Indians into positions of life settlement among our established communities. This is one of the most important lines of effort, and its value is not likely to be exaggerated. Let these channels for the transportation of Indian pupils from the reservations to the older centers of the nation be enlarged and the flow accelerated. The culture of these great schools will fit the pupils for absorption into our national life. Let the educated young Indians, as far as possible, be sifted through all our communities. The "segregation policy" of the reservation system is only a provisional arrangement to continue for a limited period. When the reservation system is abandoned and the tribal relations are dissolved, as they will be in the near future, all space limitations hitherto hemming in the red men will be removed, and the Indian left free for the widest circulation among the populations of the whole country. Thus the large industrial training schools, if encouraged to locate their graduate pupils in the older sections of the country, will be leaders in the work of introducing the Indians into homogeneous relations with our best civilization.

An acute observer has said:

The idea that the young Indians who are educated at the East should all "go back to the reservations to lift up the tribe" has been inculcated and insisted upon with an emphasis somewhat extreme. It is certain that nearly all the young people will go back for the present, whether it is best for them to do so or not. But if any Indian has a real opportunity to work and make a living in many ways anywhere among white people, he will probably, in most cases, do more to "lift up the tribe" by keeping himself up out of the squalor and disorder of savagery than he can accomplish by going back to the reservation, unless he has a certainty of employment there which will secure him a living. * * *

I was requested when I went out to the Indian country to find out as much as I could of the situation of the students who had returned to the reservations from Carlisle and Hampton. I saw many of them. I think they are generally doing as well as we could expect, which means that we could not reasonably expect much of

these young people. It is a short story. When they have employment they do well. But there is little employment for educated young Indians on the reservations, and there is a general prejudice, among both Indians and white employes, against the young men who have returned from the Eastern schools. I saw some pathetic cases of returned students who are eager to work, and who keenly feel the degradation of enforced idleness, but who could obtain no employment. There were tinsmiths, harness makers, carpenters, etc., among a population where there would not be a stroke of work for them from the beginning of the year to its end. An idle man does not "lift up the tribe." Unless there is a specific place or duty awaiting a young man's return to the reservation, I would say to him, "Go anywhere among civilized men, and do honest work for your living, rather than return to be incorporated into that hopeless, inorganic cake of savagery." When I saw stalwart, manly-looking young fellows in the Indian country wasting their years to no worthy end, I wanted to say: "Escape for your lives. Run away, get over the line, and keep going till you are so far away that it would be hard to get back. Work on a farm, do anything that is honest, live among men and become a man."

It is sometimes urged that the affection of the Indians for their children should be decisive in this matter; that it should outweigh all other considerations, and should be spoken of only with a solemn hush and veneration. But English mothers love their children as well; yet I have seen their younger sons herding cattle in Texas and Montana, overseeing miners in Alabama, and serving in restaurant kitchens in New York and Philadelphia. Our own children leave home early and go all about the world, to find work and make a living. Hundreds of tenderly reared daughters of Vermont mothers are in cotton mills of New Hampshire and Massachusetts. There is not much substance or practical value in this talk about the Indians loving their children so well that they can not bear to be separated from them. It has been used "for all it is worth" and a great deal more. If Indians are to become civilized, they will have to accept some of the risks and hardships of civilized life.

But it will not be presumed that more than a small portion of the 40,000 or 50,000 Indian youth in the country can be transferred to the larger training schools in the older States. The base of operations and the main efforts must certainly be on the enemy's own ground—in the reservations. This has become a settled conviction with me. The most important and urgent work for the present is in the reservations, in some of which the schools need to be enlarged and in others multiplied. The time has come to build more at the base and extend our educational work in the midst of the red men. Simply educating a few pupils at the East will not relieve the heartbreaking necessities of the reservations. Great good can be done for the adult Indian populations by maintaining in their midst schools for the education of their youth. These institutions, if properly conducted, will be instructive object lessons, close at hand, promoting civilization. To merely transfer a few Indian children to Eastern schools, without maintaining schools on the reservations, leaves the fatal downward gravitation still unchanged. Graduate pupils returning to such reservations will be unable to withstand the evil tendencies. The education of the many on the reservations is better than merely to educate a few far away from the reservations. Only by lifting the whole reservations can we avoid a large and irretrievable loss and furnish a ground of hope for the future of the Indian masses. Much waste is inevitable in any efforts to lift humanity, but in this case we shall diminish the waste if the lever is applied directly and more powerfully to the reservations.

In visiting over fifty reservations I have been brought constantly face to face with the painful realities of this question, especially among the Pimas, Papagoes, Navajoes, Hualpais, Mojaves, Pah Utes, Crowa, etc., where the school facilities are exceedingly meager or entirely wanting. I have been distressed not a little to find some of the worthiest agents in the Indian service upon some of the largest reservations, each of them having within their bounds more children of school age than there are pupils in all the great industrial schools combined, cut down to the most meager appropriations for schools in their reservations, and even

these small amounts secured, in some cases, only after long and repeated solicitations. The Government should not cripple the industrial schools, nor should it minimize its expenditures for education on the reservations; its highest obligation is to help those farthest removed from civilization.

This delay to which I have referred, in obtaining schools on some of the remote reservations, is very discouraging. Twenty years ago General A. P. K. Safford, of Arizona, wrote the Department as follows:

I had an interview a few days since with one of the chiefs, Antoine. He informed me that they wanted nothing from Government except schools. He emphatically declared that they had stock and grain and money in abundance, and when they needed tools they could buy them, but that he had pleaded in vain for schools for years past, and that he wanted his boys to learn to read and write as American boys do, and begged my influence to have a school established among them. I at once inquired of Captain Grossman, Indian agent on the reservation, why a school had not been established; he replied that he was restricted to an allowance of \$6000 per annum for that purpose, and that no teacher could be obtained for that sum.

And now after twenty years, in this tribe of 4,000 Indians, with a school population of 800, there is only one school with accommodations for about 100 pupils. But these Pimas have always been true friends of the whites.

SCATTERING INDIANS.

There is a large Indian population in the far West not reckoned in the foregoing statistics. These Indians are sometimes reported as "scattering," because sustaining no relation or but slight relation to the reservations.

Hanging upon the skirts of villages and cities is a roving half-gypsy class of Indians holding a quasi relation to some reservation, who often shift their homes to the mountains, to the seashore, to the hop fields, etc., and who take their whole families with them. This is an evil to be abated if we wish to advance the children in education or the parents in civilization. Many of the children are out of school for months, and out of easy range of the police sent to gather children in. Some schools never have a full quota except during the hard winter months. As soon as spring opens the pupils skip away like rabbits and never reappear, until driven in by the pinching severities of another winter. How much progress in education can this class of pupils make? And yet they often comprise fully one-third of the whole school.

Another, not small portion of the Indian population, sustain no relation whatever to any reservation; but, with a semi-intelligible dialect and a mongrel costume, find it easier to lead this half gypsy life than to settle down as orderly citizens. This class numbers thousands, scattered through California, Nevada, Oregon, and Washington, though fewer in the latter State. They range along the Columbia River, the Rogue River, the Pacific coast, east of Mount Shasta, along the Sierra Nevada, etc. Some of them are doing quite well in spite of their isolated condition, except on the line of education, which is wholly neglected save the knowledge gained from irregular contact with whites.

There are other Indians not connected with any reservation who are permanently settled upon lands gained either through the usual Government channels or by long years of possession, and who in respect to industry, temporal circumstances, and character, are seldom exceeded by the best reservation Indians. Some of these are the Nooksacks in northwestern Washington, the Klamath Rivers near the Pacific coast, the Diggers in Mendocino and Lake counties, in California, and some others.

Many of these scattering Indians, though quiet and inoffensive in a general way, are simply dogging our civilization. They have gone about as far towards civilization as can be expected until some radical change is made in the conditions under which they live. What can save them? Can education? No, for most are beyond the reach of our Indian schools a part of the time and some all the time. Can religion save them? No, for they are in too individual a form and are too transient in their habits to be benefited by continuous religious efforts.

Are these scattering Indians the "wards of the nation?" If so, what can the general Government do to provide for their elevation? If they are to be saved work must be done very soon. The policy inaugurated by the Indian Office of allowing a quarterly per capita payment for the education of children of this class in the local public schools is a step in the right direction; but this action needs to be supplemented by some provision for the supervision of these Indians and some power to force attendance upon these schools.

Are these scattering Indians members of the "whole human family?" If so, then every Christian community in which is found one of these Indian families is bound by the great law of "the brotherhood of man" to see that this family is brought within the pale of religious influences.

QUALITY OF INDIAN EDUCATION.

I need not speak at length upon this point. Two thoughts will commend themselves widely.

First. The literary instruction should be elementary. Even in the higher training schools, a portion of the pupils, as they are now gathered, begin on the same low level as the reservation pupils. This instruction should include primarily English speaking, to be followed by drawing, reading, writing, and spelling. So much arithmetic should be learned as will fit the pupils to transact necessary business, as laborers, artisans, and traders; and to guard their interests against the trickery of white men. A knowledge of elementary geography especially of the topography of our world, its natural, political, and climatic divisions will broaden thoughts, dissipate many Indian superstitions, and help prepare these pupils for contact with the outside world. The elements of anatomy and hygiene will be very serviceable, in practical life and in leading Indian youth from under the tyranny of the old medicine quacks. The knowledge of the structure of sentences, taught in a simple way, will facilitate the acquisition of English. But first, last and always, English conversation and intelligent English reading should be made prominent features of the school room drill.

The chief periods and the leading events and characters in the history of the United States should also be taught. But do not let the classes be kept too long upon the details of the early discoveries. I find that most history classes in Indian schools have not yet passed the period of the discoveries; a few have reached the Indian wars upon which they are dwelling at such length as to leave the impression that the leading events in United States history have been the fighting of Indians. Very few know anything about the grand events of the later periods.

Lessons in civil government are best given in brief oral lectures, if accompanied with suitable drilling.

Talks upon botany and zoölogy, illustrated from the surrounding country, will discover to the teacher with what sharp eyesight and

keen insight these children of the forest and plain have studied the habits of flowers and animals.

Beyond these elementary branches instruction may be given in the training schools to such pupils as show genius for further progress, and exceptionally bright pupils may be aided to obtain a collegiate education. The universal demand in these days for good nurses, and the great need of women with medical knowledge among the Indians, open fields into which many noble Indian girls should be introduced.

Second. Far more important to these children than literary culture, is industrial training. In many reservations I have visited industrial training is a necessity in order to a livelihood. Instruction should be chiefly in agriculture, gardening, fruit raising, and care of cattle, especially of cows. Blacksmithing, carpentering, and shoemaking will be valuable aids. In the large industrial schools other trades may be taught, some of which will be serviceable to boys settling down in the older communities, and any of which will be broadening in their influence upon boys returning to reservations, even where these trades can not be utilized. But such trades should not be pursued to the neglect of practical knowledge which is indispensable amid the rigorous necessities of the home field. Sometimes boys have been taught almost exclusively some trade which can never be utilized on a reservation, and thus equipped are sent back depending upon that trade for a livelihood. They are grievously disappointed and injured and unable to turn their hands to other work. If they had been taught farming, or care of stock or gardening, they could have done better; but it must not be forgotten that there are reservations where little can be done on the line of agriculture, and raising stock must be the main reliance.

It is very important in our Indian schools to guard against the unduly intensified and overstrained methods of many modern educators. Some of our most intelligent and highly educated citizens, like Rev. Edward Everett Hale, L. L. D., and the celebrated English Review writer, Frederick Harrison, frequently protest against it. The latter in a recent number of *The Forum*, said:

I have now an experience of some forty years as student, teacher, and examiner; and it forces on me a profound conviction that our modern education is hardening into a narrow and debasing mill. Education is overdriven, oversystemized, monotonous, mechanical. At school and at college, lads and girls are being drilled like German recruits—forced into a regulation style of learning, of thinking, and even of writing. They all think the same things, and it is artificial in all. The round of endless examinations, reduces education to a professional "exam," where the repetition of given formulas passes for knowledge, and where the accurate memory of some teachers' "tips" takes the place of thought. Education ought to be the art of using the mind and of arranging knowledge; it is becoming the art of swallowing pellets of special information.

Indian pupils should be taught to study nature amid their home surroundings on the reservations, to use their minds in picking up, classifying, and applying facts within their reach, good topics for many oral lessons teaching the pupils how to observe and think. The industrial teacher at every Indian school should be a man who will study the peculiarities, agricultural and climatic, of the reservation in which the pupils live, and will teach them the methods of husbandry adapted to their locality, the kind of vegetables, grains, and fruits suited to them. There are some reservations where in three out of every five years, all agricultural crops fail. In these places instruction should be given in stock and sheep raising, with special reference to the care of the young in the flocks.

I know of one Indian who, starting in life as a slave child, captured in war, became first a rail-splitter, and later a cattle raiser, in which he

has been so successful that now his property is rated at tens of thousands of dollars. His home is situated 5,000 feet above the sea level, where agriculture is precarious, except hay raising, but he was instructed and guided by a wise industrial farmer employed by the Government, in his locality. This Indian is withal a man of high character, morally and intellectually, and very industrious. Other conspicuous examples can be pointed out on many reservations; and these examples will be multiplied many fold if the Government is careful in regard to the character and qualifications of the farmers and industrial teachers sent out to instruct her "wards."

If examples of what Indians have done on the lines of morality, industry, and education were oftener taught to the pupils in these schools and less often the examples of the old world heroes were used as illustrations, these pupils would acquire faster the so much needed self reliance which is to make them men and women, among men and women.

HINDRANCES.

Of the many impediments in the way of the best concentration and unity of labor in the Indian school service I will mention a few, as I have met them in the field.

Frequent changes in the personnel of the Indian Bureau at Washington, at the agencies, and also in the schools is one of the serious obstacles in the way of systematizing and making effectual the work of Indian school education. It is one of the weaknesses of human nature, except in rare instances where it rises above the common level, that new incumbents look with jealous eyes upon the work of their predecessors, criticize it unkindly, and often discard methods which were in a fair way of achieving success. If the new officer criticizes very much, it is safe to assume that he is inferior to the departing one, and that such criticisms and changes are prompted by incompetence rather than by genuine ability. All changes cause great waste, and no change should be made except for grave reasons. It takes not a little time for new comers to gain the confidence of Indians, old or young; and when gained it is no small loss to sacrifice this confidence. Indeed frequent changes are the bane of the Indian service.

But the appointment of superintendents, teachers, and other employés, on the nomination and solicitation of politicians, as rewards for party services, more seriously than any other single cause, militates against the welfare of the Indian schools. Some candidates are brought forward because of political services on the rostrum, or in the caucuses, or in the field. Others because they are political paupers or dead beats who must have a Government position in some school, so they may "get a piece of bread." Some applicants presented are utterly wanting in character, competency, or fitness, though some friend has been found willing to certify to their possession of these qualities, thus grossly misleading the Congressmen who have presented the names to the Indian Bureau. The removal of devoted, self-sacrificing laborers, who have performed the best of services in the Indian schools, to make places for such make-shift candidates is a serious offense. How many schools have been crippled and retarded by such action! I can not help asking why Indian schools should be subjected to such political interference, when partisanship is not allowed to touch our public school system. Must the Indian schools be the foot-balls of the politicians? Must partisan claims override genuine merit? I am surprised to find officials in high positions who have no just conceptions

of the character and qualifications needed for good service in an Indian school. It has been said too often in regard to unworthy aspirants for such positions that "any one is good enough for an Indian school." I have personally seen many examples of the disastrous workings of this low and scandalous policy.

Sometimes trouble in an Indian school grows out of want of affinity between employes. They belong to radically different types of society, a high and a low type; and the school force is continually disturbed by the petty jealousies and complaints of persons unable to rise to the level of the better elements associated with them. Indeed this is liable to be the case in all public schools; but where the employed constitute a community by themselves, as they do on reservations, the trouble becomes more serious.

Sometimes there is a good superintendent, but cold and stiff, and his associates are of such a different type as to make a great gulf between them, though the teachers may be as truly devoted to their work as the superintendent. They meet, speak, and work, but without sympathy or common impulse. Sometimes the agent looks askant upon school officials not chosen by himself, and coldly neglects the school until he can find occasion, real or fancied, to complain of those officials to the Department and procure their removal.

A lack of appliances for school instruction—books, maps, blackboards, globes, kindergarten materials, etc., is another great hindrance to success. The fault sometimes is because these articles are overlooked when the annual estimates are made up; sometimes because the agent has no idea that such helps are needed in schools, the old superintendent doesn't care and the new superintendent is not yet on the ground; and sometimes because no one save the agent knows that such helps have come, and he believes they'll keep longer in the warehouse than in the school room.

The following utterances from one long deeply interested in the Indian question, and one* of the most prominent members of the Board of Education, Boston, Mass., are worthy of special attention, because of his long experience in the practical work of selecting and assigning teachers.

The principles laid down should be these: (1) That all appointees should be certified as to character and teaching ability by the supervisors or expert teachers. The appointment should always depend upon professional and not political qualifications, and upon professional and not political indorsements. (2) After a proper and limited period of probation, all teachers should be put upon a permanent tenure, removable only for cause. (3) If the conditions first named are fulfilled, the religious sect or political party to which one belongs should not be a barrier on the one hand or a motive for appointment on the other. (4) Vacancies should be filled, wherever possible, by promotion from a lower to a higher grade.

The objection will be made that while this is practicable in our regular schools, it is impracticable in the Indian service; that it is difficult to get teachers for this work, etc. I would reply that the way to get good teachers is to raise the standard and make the position permanent. Is it any wonder that teachers have not been eager to take such appointments when the positions have been so insecure and dismissals likely to come any moment? Let the conditions be made right, and there are enough consecrated young men and women in this country to fill every place.

While there may be some difficulty in carrying out in detail the aforementioned scheme in so widely extended a country and with such a diversity of inspectors, agents, superintendents, etc., reporting in regard to teachers and schools, nevertheless it must be confessed that the principles laid down are essential, just, and rational, and should be used as beacon lights in the administration of Indian schools. At

* Hon. S. B. Capen.

the same time it must be kept in mind that adaptability to this Indian-school work depends upon peculiar qualities more important than purely scholastic qualifications; and that political or denominational availability is a questionable qualification.

It is becoming a matter of great importance that the Government look carefully into the character of the men appointed as Indian agents, lest the progress of the Indians be retarded and their characters vitiated by those intended by Government to be leaders and benefactors. The standard of agents and employes must advance as Indian civilization advances or Indian civilization will turn the other way. Under the administration of some Indian agents this downward gravitation is painfully apparent. Only a high type of officials can now be the true guides of these tribes to the more advanced stages of civilization.

SYSTEM.

The work of Indian education under Government direction hitherto has been quite incoherent and without matured system. Methods and machinery have been abundant, but too inorganic and inefficient. Exceptionally good schools have existed; able superintendents, zealous teachers, and ambitious pupils each and all have labored faithfully; but as a whole the work has been too inchoate, with great wastes of force and means. It is a matter of congratulation that now all along the lines from Washington to the reservations there are indications of convergence, of organizing life forces, and increasing unity of aim and effort. How far this can be carried remains to be seen. The diversities are so great as to seriously militate against attempts to combine in one general system children of tribes most remote from civilization with those far advanced—children of roving tepee Indians with those whose parents are settled and domiciled.

The complex character of the work in the Indian Bureau is a disadvantage long felt by those familiar with it. The solution of the difficulty, however, is not clear. It is often suggested that the educational department should be separated from the purely economic, legal, and judicial department of the Bureau, and that the superintendents of schools should be independent of the Indian agents; but so many questions naturally run into each other in the course of administration both at Washington and at the agencies that no one has been able yet to draw the line of demarcation for a new policy. Moreover the fear is not without foundation that to change centers of responsibility may involve much loss of time, energy, and labor. Continuity of methods is generally favorable to development; nevertheless it has been found sometimes that radical changes are necessary to successful administration.

CONCEITS OF PROGRESS.

Nothing is more natural than for persons only a few weeks or months in the Indian Service to write extravagantly about the progress of the Indians towards civilization. Many rose-colored reports continually come to the Indian Bureau from persons who have not yet settled down to the basis of life on Indian reservations. Indian conferences and anniversaries in the East are often regaled with vivid descriptions of the rapid strides of the red men towards citizenship. Judging from these immature sophomoric utterances we might infer that Indian reservations, Indian agencies, and Indian agents must soon be consigned to oblivion. These enthusiastic friends of the Indians who have just

pushed to the front are very unappreciative of what has been done by old-time agencies in this field. With little knowledge of the past, methods instituted and worked years ago are taken up and advocated by these reformers as though they were the real discoverers and held the exclusive right to patents which are to solve finally the Indian problem. Veterans who have retired after many years of heroic service smile at the conceit of the newly fledged advocates. Persons who presume that little has been done until now may be instructed by a few quotations selected at random from reports which came to the Bureau twenty years ago.

1. "Forty-nine pupils have been maintained and educated through most of the year. The boys have made good progress in the studies usual in common schools, and have labored with skill and industry in the gardens. The girls have made rapid advancement in their studies, and are excellent seamstresses."

2. "During the past year I purchased for the Indians 1,400 fruit trees of assorted varieties. These were set out on the reservation and on lands cultivated by the Indians for their own benefit."

3. "Drinking, gambling, and licentiousness have been charged as peculiar vices of the Indians. I do not think there is any great difference in these respects between them and the uneducated whites. Give the Indians plenty of work, with fair and regular pay, and they will labor as industriously and live more virtuously than any other uneducated people I have encountered."

4. "The plow and wagon maker, the carpenter, the blacksmith and gunsmith, have all been constantly employed in attending to the wants of the Indians, either in repairing old or in making new articles for their use. In the school, instruction in writing, reading, and arithmetic has been given in the morning, and saddlery was taught in the afternoon with good success."

5. "It is no longer a problem in my mind whether Indians can be civilized and Christianized; this fact has been fully and practically demonstrated among the Indians. Those people are making rapid strides in the arts of husbandry, in the fencing and general cultivation of the soil. They also manifest deep interest in Christianity; they have a fine church erected and furnished at their own cost. Twenty-three of their children attend school at ——— and some of them have made quite a good degree of proficiency. In consequence of their improvement in their moral and social condition, their numbers are increasing. There is also a corresponding increase in their flocks and herds and a great augmentation in their domestic comfort. In consequence of this favorable condition among them, they have mostly abandoned their tribal relations; and they are living scattered over the reservation on lands they cultivate. I find they are more healthy and industrious and cultivate more land."

6. "A decided progress in civilization has been made. * * * These people now believe that the Government now recognizes them as wards or children; provides for their wants, not as aliens, but only to prepare them for the duties of citizenship; that they have a part in all that pertains to the General Government; that they are to enjoy all the rights of citizens, and that whenever they prove, by the adoption of our manners and customs, the abandonment of their native ways, they are then qualified to enjoy such a boon. I assert, fearless of contradiction, that this very idea has done more in one year to elevate the Indians in Oregon than all the cruel and inhuman regulations ever invented could accomplish in ten years."

7. "My predecessors recommended in the strongest terms that the land on the agency be surveyed and given to the Indians in severalty. * * * No man can visit this agency without being impressed with the wonderful improvement of these Indians. They are marching along, not slowly, but with rapid strides to civilization. Less crime has been committed by them in the past year than by the same number of whites. Not a drunken Indian has been seen on the agency during the year. * * *

The studies pursued in the school are as follows: Spelling, reading, writing, arithmetic, and geography. Some pupils are quite intelligent and studious, are good readers and spellers, write a good hand, and have stored their minds with a large amount of practical knowledge. * * * Quite an extensive garden is being cultivated by and for the school, and it will afford them a large amount of good and wholesome food. * * *

In addition to their study of books, the girls are taught the art of housewifery, and the boys to perform all kinds of labor that boys of their years are capable of performing."

8. "Great care will be necessary to make the school attractive and interesting to the children to insure its prosperity. It will be well to have needlework and some other light branches of industry carried on in connection with the school."

9. "The studies pursued have been: Reading, in which much advancement has been made; writing, specimens of which would do credit to many white children; arith-

metic, in which ordinary ability has been displayed by the pupils; geography and Mitchell's outline maps, in which a greater degree of interest has been manifested than in any other study; and vocal music. The comparative advancement of these children with those of the white is most astonishing, and although hardly credible, I must say that by far a greater degree of acumen of intellect and a desire for the acquirement of knowledge has been exhibited than will be found among white children of the same age.

10. "The course of instruction has been purely elementary; but there are some exceptional cases where there has been a diligence displayed on the part of the scholars which has far advanced them beyond white children of the same age."

11. "The girls have been instructed as far as practicable in the rudiments of house-keeping, the making of clothes and other domestic occupations, and such other necessary work as will qualify them to fulfill in the future the place of good housekeepers; and they not only exhibit a willingness on their part to learn, but are constantly inquiring for information which will eventually make them qualified and competent housekeepers."

12. "We have in our school adopted the method of object teaching, using illustrated charts and cards upon which are fastened miniature articles of shell, furniture, cooking utensils, etc. The children readily acquire the English of these and are much pleased and interested."

13. "Our method is object teaching, from the liberal supply of toys, cards illustrated, and pictures sent by —, and also all household articles which we could carry from our house to the schoolroom."

14. "The skill and industry displayed by these young Indian mechanics is as unexpected as gratifying. * * * The labor of making the bricks is performed chiefly by the Indians, under the supervision of two white men; but it is designed, in a short time, to use Indian labor alone in the manufacture of them."

Such were the views of Indian progress entertained twenty years ago by prominent persons familiar with the condition of Indians at that time; and that is the way many speak of the progress of Indians at the present time. These utterances are made in all sincerity, though oft-times too sanguinely expressed. It is well that Indian workers are hopeful and see gleams of light, otherwise no one could toil on. A brighter day for the Indian is certainly coming; but we should not close our eyes to the fact that for years to come there will be mists and clouds in some localities, and in many others periods of protracted darkness. No one line of policy, no single compendious method will fully solve the problem; and for years to come philanthropists will find among our Indian population ample fields for toil.

No class of people more readily fall from stages of progress than Indians. It is difficult to impart to them staying qualities. I have personally visited several of the localities referred to in the preceding quotations, and after going over the reservations can not refrain from saying that the present condition of the Indians in some cases, in respect to thrift, industry, crops, sobriety, dress, etc., seems much inferior to that described twenty years ago. The houses are poor, indecent, filthy, and out of repair. With some of the best land in the world and good markets near by, they raise only small quantities of produce, preferring to get money by catching a few fish. Many Indians are addicted to drunkenness and gambling, and some are violently opposed to the education of their children. But twenty years ago we were told "those people are making rapid advances in the arts of husbandry, in the fencing and general cultivation of the soil."

In another place my statements only apply in part, but the condition of the school has apparently retrograded. The school garden has not been for years what it used to be, and the girls learn little needlework. I have visited Indian schools which were among the oldest in the service, but which now are among the most inferior.

In many places there are only relics, and in some places not even relics, of the fruit trees set out fifteen or twenty years ago.

Twenty years ago certain tribes were described as follows:

They are the most degraded of any Indians in the State. They live around the towns, doing transient jobs of work for the whites for wages, victuals, or odd clothing. They kill some game and catch a few fish, for which they generally find a ready market. About two months in the year they spend in gathering pine nuts in the mountains for winter use. The majority of them are slovenly in appearance and filthy in habits. They are peaceable, inoffensive and tractable. * * * They have no horses or other domestic animals, and live principally on lizards, snakes, sunflower seeds and pine nuts. * * * There are a few who engage in farming to a limited extent; they raise a small quantity of corn, wheat, and melons; but those who are disposed to labor have no kind of utensils, using sticks to plant and knives to harvest.

The above description of a particular tribe twenty years ago is still literally true of them, and also of many other Indians, but I do not refer to the tribes of Arizona and New Mexico.

Twenty years ago, Sarah Winnemucca, a native Pah Ute interpreter, at Camp McDermit, Nevada, wrote:

If the Indians have any guaranty that they can secure a permanent home on their own native soil, and that our white neighbors can be kept from encroaching on our rights, after having a reasonable share of ground allotted to us as our own, and giving us the required advantages of learning, etc., I warrant that the savage (as he is called to-day) will be a thrifty and law-abiding member of the community fifteen or twenty years hence.

The period referred to in the foregoing hopeful utterances has more than passed, and still the conditions of Miss Winnemucca's prophecy are unfulfilled, and consequently the results are not yet realized, especially among the Pah Utes of Nevada. There still remains the question of allotment, the advantages of learning, a permanent home, and whether white men can be kept from encroachments upon Indians' rights.

The question of abandoning the reservation and agency system, agitated for more than a score of years, is still an open question and likely to remain so for a long time to come. Some Indians may not need this aid, but the class is not numerous. Most Indians for a long time will need protection against the rapacity of the whites who hover like vultures upon the borders of the reservations, and are never more greedy than after allotments are made to the Indians. As a race the red men lack self-reliance and self-directing power—the natural effect of the centuries of ignorance, idleness, and hap-hazard lying behind them—and will long need to hold the relation of wards, that they may have the benefit of paternal counsel and advice. We must not expect that a few Indians right out of savagery can acquire such development in civilization as to leaven at once the mass of barbarism. But only men of high character should be selected by the Government to hold the relation of Indian agents for the nation's wards.

Such are some of the phases of this problem which will long wait full solution, however much we may desire the hastening.

Respectfully submitted.

DANIEL DORCHESTER,
Superintendent of Indian Schools.

THE COMMISSIONER OF INDIAN AFFAIRS.

REPORT OF SUPERVISOR OF EDUCATION AMONG THE SIOUX.

STANDING ROCK AGENCY, N. DAK.,

September 27, 1890.

SIR: I have the honor to submit, at your request, the following report of my work from the date of my appointment as supervisor of education among the Sioux, March 5, 1890, to October 1, 1890. The time has been so short as to enable me to make but a partial survey of the field, and my account of the schools will, therefore, be necessarily incomplete.

The position of supervisor of education having been created at the time that I was appointed to fill it, my duties and powers are not defined by any precedent, and may be modified or enlarged to suit the exigencies of the work and the development of events. In a letter of instruction, under date of March 5, I am directed to "systematically visit all the schools among the Sioux, ascertain what they need, report the deficiencies, advise inexperienced teachers, devise ways of reaching the children, introduce industrial training into the day schools, and, in general, systematize, extend, and improve the schools as far as possible."

Acting upon these instructions and guided by previous experience and knowledge of the situation, my aim is to leave nothing undone which I can by any means do to encourage and rouse the teachers, to interest and stimulate the children, to satisfy and inform the parents, and to lay before the Indian Department such detailed, exact, and reliable statements as will enable you to improve the teaching force, place new schools to the best advantage, and properly equip with necessary buildings, furniture, and supplies the schools already established.

To begin with the most important factor in any school, the teacher, * * * I understand it to be the present policy of the Department to man the Indian schools with trained, experienced, successful teachers, and if the work is to be judged by its results it would be true economy to engage such at double the salary paid to the incompetents. The difference in the advance made by two neighboring schools in the same number of years is often startling. It is no exaggeration to say that one teacher will accomplish treble or quadruple the work of another in a given length of time. I consider the greatest lack of the Sioux schools at this moment to be a lack of skilled teachers, and that no pains should be spared to secure for every vacancy a live member of the profession with a reputation to sustain.

I beg to remind you, in this connection, that women are generally more successful than men in the primary school-room, and notably so, in my opinion, in this Indian school work, as they are also far more likely to win the affection and call forth all the higher qualities of the primitive people by whom they are surrounded.

Knowing, however, that no sweeping change is likely to be effected, it has been my policy to endeavor to make the most of the material at hand, and to do better things with the present corps of teachers than have been done before. I have recommended the removal of school employes only in a very few cases which I was forced to regard as hopeless. After I have listened to the usual recitations and observed the method, or want of method, of each teacher for two or three hours, I usually question the children somewhat, and if I am dissatisfied, illustrate what I regard as better ways of teaching by giving several lessons myself. Sometimes I take the whole school for an afternoon and teach for the benefit of the teacher. The commonest defect in these schools is in the language work; the reading is apt to be mechanical and parrot-like, with no attempt to make the children understand and use the words which they merely learn to recognize at sight. After I have thus indicated to the teacher the general scope of my ideas of school work I talk with him after school as long and as freely as possible, pointing out what I regard as the special defects of his work in such a way as to stimulate and help, if I can, without awakening resentment or wounding his self-respect—a delicate task.

After leaving the school, I write to each teacher a letter of criticism and suggestion, repeating and dwelling upon the points made in conversation with a view to impressing them upon the memory. If I consider his work good and satisfactory, I commend it warmly, and if I regard him as hopelessly unfit for his position, I tell him so.

My next step for the improvement of the teachers was the holding of teachers' institutes and the organization of teachers' reading circles. Until the summer of 1890, there had been no general teachers' meetings in any of the agencies. I have now held three for the teachers of the Pine Ridge, Crow Creek, and Lower Brulé and Cheyenne River Agencies, and propose to hold one or two more during the present autumn. Nearly every teacher in the three agencies at the time attended these meetings, which were in each case of three days' duration. All agency employes, missionaries, and visitors are cordially invited to attend the meetings, and those who are able to do so

are requested to address them and take part in discussions. Complimentary invitations are extended to all teachers of contract or mission schools in or near the agency at which the institute is held.

The superintendents of the boarding-schools and others have aided me in giving talks on methods in reading, language, arithmetic, geography, etc., illustrated by black-board outlines and model lessons. The afternoon lessons are usually devoted to the more general aspects of the work—school government, sanitary conditions (upon which the agency physician is asked to speak), training for citizenship, the preparation of the teacher, eastern schools and Indian associations, being among the many subjects discussed. Questions are freely asked and all are expected to take part informally in the discussions. The institute at Cheyenne River Agency being held while the schools were in session, two mornings were given up to a careful study of the actual work in the school-room, at the two excellent boarding-schools. The social features of these reunions have not been forgotten, and picnics, drives, dinners, and afternoon teas have brought the teachers together in pleasant ways, the more keenly enjoyed by those whose lives, at their remote posts, are lives of extreme isolation.

I think there can be no question that this experiment has proved a success, as is indicated by the growing interest and animation of the teachers; their voluntary requests for a continuance of the institute, and, not least, their willingness to spend time and money in acquiring a better mastery of their profession. Branches of the Chantauqua Teachers' Reading Union, organized at each institute, number now eighteen members in all at the three agencies, pledged to a three years' course of professional study. Other books have been sent for and subscriptions to educational journals taken. These evidences of growing interest and ambition are encouraging, and I regard it as important to develop this line of work, and hope to hold institute, or summer schools of much longer duration where primary methods, kindergarten physical culture, manual training, etc., may be systematically presented by competent instructors.

I will next consider briefly the present condition of the school buildings among the Sioux, with the amount of stock, school furniture, and supplies. These are all, in my opinion, sadly limited in quantity, and usually deficient in quality.

There is not one Government boarding-school, that I have visited, with room and conveniences for the work. They are, as a rule, overcrowded, badly arranged, more or less out of repair, and generally unsatisfactory. The dormitories are in every instance too crowded and insufficiently ventilated. A bath-room, or hospital-room is seldom to be found. The want of suitable sitting-rooms or play-rooms for the children is a serious one. The school-room furniture is usually scanty, and the modern helps, such as number tables, molding-boards, kindergarten tables and material, etc., entirely lacking. The text-books are of many different series—good, bad, and indifferent. The clothing furnished the children in the boarding-schools is fairly good and their appearance usually neat, but there is a deficiency in the matter of woolen underwear and other things which do not appear. The food I regard as of insufficient variety and would state that more vegetable and farinaceous foods, dried or preserved fruit, milk and eggs are needed, and that more skill and care in the cooking should be insisted upon. There are no training shops in connection with any of the Government schools which I have visited, and the barns are ordinarily few and poor, while the amount of stock kept is altogether insufficient, and the garden or farm usually too small to fully supply the school.

In the day schools the accommodations are equally limited. A day-school building usually consists of one class-room and two or three small rooms for the teacher or teachers, sometimes a family of several persons. The schools vary in size from ten to seventy or more pupils. In many cases the school-room is too small, or another recitation room may be needed; and a large room for school kitchen, dining, and sewing rooms is wanted at all. The teachers' quarters, too, are contracted and sometimes very uncomfortable, owing to the open construction of the building. The new day-school buildings should be much more commodious, or, better still, consist of a separate school-house and teachers' cottage; and additions are wanted at nearly all the present schools.

It is my opinion, based upon an experience of three years as teacher of an industrial day school, together with my observation of other day schools, especially some of those at Rosebud agency, that, given a suitable building, furniture, and utensils, a supply of clothing and sewing materials, and rations for a substantial midday meal, with two capable persons in each school, nearly as thorough and practical work may be done in a day as in a boarding-school, at far less expense. I regard it as only reasonable and humane to allow the Indians an opportunity of educating their children without forcing them to a complete separation, and I have seen remarkable instances of the good influence of such a school in an Indian community. Therefore I continue to urge this extension and improvement of the day-school system, while admitting that, as matters now stand, the boarding-schools can usually show the better results.

In my talks with the day-school children I usually direct their thoughts to the idea of a possible promotion to the boarding-school as a special privilege and stimulus to exertion, and often suggest the transfer more particularly to a few of the oldest and best scholars, cautioning the teachers as well not to threaten their pupils with the boarding-school as a punishment for bad behavior, as some have been in the habit of doing, but to offer it rather as a reward.

No feature of the work, as I see it, is more striking, or, properly viewed, more encouraging, than the intelligent interest in their schools which is now so general among the Sioux. I suppose I am safe in asserting that my familiar knowledge of their language and habits of thought, not acquired without study and pains, together with the fact that I had already traveled much and was quite generally known among them before I took up my present work, give me unusual advantages for ascertaining facts known to the Indians and getting to the bottom of their opinions. Well as I thought that I knew them, I have been surprised again and again by the shrewdness and soundness of their judgments upon particular schools and teachers. They are, like other people, occasionally untruthful, but they are keen students of character and do not often make a mistake. The suggestions for the general improvement of the schools, volunteered by thoughtful Indian parents, returned Carlisle and Hampton students and others, at different times and in different places, have included nearly all the important recommendations which, independent of these suggestions, I have thought it right to make. Only in one or two instances have I found it necessary to urge the parents to send their children to school, while in a great number of cases the Indians have sent for me and urged the establishment of more schools or the enlargement of those which they already had. They have written long lists of names of children who were ready to attend a day school if one could be built, and have begged me to go with them behind their own teams to verify the location.

I have observed a strong and very generally expressed preference for schools at home to those away from the reservations, and while I myself favor home schools for the majority, I take care to point out to the Indian parents and the teachers of reservation schools (who are usually of the same opinion) the popular enthusiasm which has been aroused by Carlisle, Hampton, and other eastern schools, and their advantages in point of breadth and thoroughness of training. I have been in the habit of showing everywhere my Carlisle and Hampton photographs, and take care to ask for, and see, if possible, the graduates of those schools wherever I go.

I believe that the Sioux as a people are now so thoroughly persuaded of the necessity of an education for their children, and so far on the way to an intelligent grasp of the whole subject, that if they can be gradually thrown more upon their own responsibilities and resources, they will soon be in a position to take care of their own schools. In the mean time, I remember that these schools are built and conducted with Indian funds, and endeavor to recognize fully their claim to pronounce upon them and to have a voice in their management, believing that in this way we are developing self-respect and independence.

I have inspected three contract schools, all Roman Catholic, and two Protestant-Episcopal mission schools. The three Catholic schools vary greatly from each other in building and sanitary arrangements, the one at Pine Ridge being the best, and that at Crow Creek the poorest in these respects. All have good farms, and two have small shops. Neatness and industry are features of these schools. I regard the classroom work as open to criticism on the ground of being mechanical and lifeless. Words and rules are committed to memory and the reasoning powers but little developed. I should say, also, that the atmosphere is unhomelike, and no social intercourse whatever is permitted between the boys and girls. I think that all contract schools should be required to pursue the official course of study, and in every way to come up to the standard of the Indian Office. Bishop Hare's two mission schools at Rosebud and Cheyenne River Agency are models of their kind, and in the arrangement of the house and grounds, industrial training, and class-room work are among the very best Indian schools.

I have referred to the course of study. I keep a permanent record of the name, age, number of years in school, grade, general health, and such important facts as I can gather in regard to each individual pupil in the schools. I graded them at first in the only way possible, by the reader, meanwhile advising the teachers of neglected points, and looking forward to the establishment of recognized grades, each corresponding to a year's work. So soon as I had received a copy of the new rules for Indian schools, with a course of study, I began to aid the teachers in each school to classify the pupils by it, and taking them up individually, by name, recorded the grade to which each should work during the present school year. The classification must necessarily be at first imperfect, owing to the lack of system which has formerly prevailed, and the one-sided teaching hitherto done in many of the schools, but by patient and well directed efforts these irregularities can be smoothed away, and it would be hard to overestimate the benefit to teachers and pupils of knowing what is

expected of them, and working toward a definite plan. My criticisms are also rendered less arbitrary, for now each teacher can compare his work with the standard, and see for himself wherein he has failed and in what he has succeeded.

I have attempted to supply a want by arranging a daily programme for day schools based upon the course of study which is now approved and in practice.

During the last six months I have traveled in wagon and on horseback some 1,500 miles, and have passed fifty-five nights in my tent. Most of my meals during that time have been prepared and eaten in the open air. My outfit, at my own request, consists of a roomy mountain wagon and two good horses, with complete camp equipage, and an Indian man and his wife to accompany me, and I am thus entirely independent and reasonably comfortable. The great distances to be traversed and the total absence of rail ways and hotels renders this the only practicable method of reaching all these schools, and much time must of necessity be consumed on the road. I have visited thus far thirty-seven schools, on the Crow Creek, Lower Brail, Rosebud, Pine Ridge, and Cheyenne River Agencies, taking them in the order named, and I hope by being constantly in the field during the months when such travel is possible, to visit every school under my supervision twice in a year. I fix no dates beforehand, and my coming is always unannounced. I am in constant correspondence with many of the teachers, and hope to render them some assistance in that way during the winter months, when but little traveling can be done on the prairies.

ELAINE GOODALE,

Supervisor of Education among the Sioux.

THE COMMISSIONER OF INDIAN AFFAIRS.

REPORT
OF
THE POSTMASTER-GENERAL.

POST-OFFICE DEPARTMENT,
Washington, D. C., November 29, 1890.

To the PRESIDENT :

My first annual report covered less than four months of your administration. This, therefore, is the first statement of a full year's work which I have had the privilege of submitting. I beg to outline, in the first place, some of the things accomplished, or partly accomplished, and then to add certain recommendations for the further improvement of the postal service.

Bills have been passed by Congress to provide for a new post-office building for the city of Washington ; to establish sea post-offices for the distribution of foreign mails in transit and their immediate dispatch inland at New York ; to provide fifteen days' leave for post-office clerks ; to experiment with the free delivery in small towns to see what can be done towards its quicker extension everywhere ; to add necessary officers and provide for leaves of absence in the Railway Mail Service ; and to exclude lottery literature from the mails. A bill to establish a limited post and telegraph has been unanimously reported by the Senate Committee on the Post-Office and Post-Roads and numerous arguments in its behalf have been heard by the House committee. Bills have been advanced a stage or further to permit the Department to forward matter on which postage has not been prepaid ; to reduce the limit to which the free-delivery service may be extended down to towns of a population of 5,000, or to offices whose revenue is \$7,000 ; to provide supervisors of postal districts and additional officers to make the departmental service more efficient ; to fix a penalty for the burglary of post-offices ; and to reclassify mail matter, so that a million dollars a year may be saved to the postal revenue.

Bills passed,
advanced, or
placed upon the
Calendar.

The suggestion of the Department that \$500,000 would suffice for the inauguration of the eight-hour system in post-offices by promotions and by the employment of additional men in preference to the payment of extra wages for more than eight hours of service per day met with small favor; and the bill which proposed to appropriate \$2,000,000 or more, without, as I believe, accomplishing any more than the \$500,000 could be made to accomplish, was allowed by its friends to remain upon the Calendar. A bill better to classify the clerks in the Railway Mail Service is also on the Calendar. The postal-shipping bill occupies the same position of advantage.

Administrative
changes for the
better.

In the administrative methods of the Department itself some changes for the better have been made. A new series of smaller stamps, criticised, and justly criticised, at first, so far as the two-cent stamp was concerned (though the Department employed the same engravers and materials as formerly), are now, it is believed, quite acceptable to the public. Over two hundred thousand dollars has been saved on the contract for postal-cards, which, though they were properly criticised at first, were quickly brought up to the required standard by the contractor. Four hundred thousand dollars has been saved on the contract for stamped envelopes. Two hundred thousand dollars or more has been saved on certain lettings of contracts for carrying the mails, and at the same time the mail routes have been extended over almost 2,000,000 miles of railway and steam-boat and stage lines. The same number of inspectors have treated 87,736 cases during the year, against 66,364 treated last year, or an average of 1,213 per man this year, against 938 last year. The total number of cases on hand July 1, 1890, was 21,637, against 28,040 on hand July 1, 1890. This means an increase of 33 per cent. in cases treated, and a decrease of 22 per cent. in cases on hand. The anti-lottery legislation has entailed much extra labor upon the inspector force, but, on the other hand, the temptation to thieving among employes of the Department has been much diminished by the same means. The past year has been made very disagreeable to the "green-goods" swindlers.

Negotiations with the German authorities looking to the establishment of sea post-offices have been successful. A commission of expert accountants has been appointed thoroughly to examine the postal system and establish a uniform and simpler system of accounts for post-offices. Accurate counting and weighing of mail matter at all the post-offices of every grade have been made, and exact data

gathered thereby touching the amount of free matter and matter of each class carried by the Department; and estimates indicating the effect of a reduction of letter postage to one cent are included. A commission of postmasters has examined nine hundred models, designs, and suggestions of house letter-boxes to find something which, if universally adopted, would save a quarter part of the time of the carrier force of the Department. Several times postmasters, inspectors, and railway-mail superintendents have been called to Washington in groups to exchange ideas of benefit to themselves and to give the Postmaster-General the encouragement of their experience.

A few figures illustrate how much the business of the Department has grown. The gross revenue is nearly \$5,000,000 larger than it ever was before. Almost five thousand new post-offices, more than in any one year before, have been established upon the petitions of communities which have needed them. A decreasing limit for the extension of the free delivery has permitted the employment of letter-carriers in over fifty towns. Three times as many substations and stamp agencies (which soon pay for themselves) were established as during the previous year. Over 5,000 miles of R. P. O. service, so called (where traveling post-offices distribute the mails for instant dispatch), have been put on. The 58,000 transportation schedules have been examined, and adjusted or extended where it has been possible. Thirty-six per cent. more of city mails have been distributed on trains for instant dispatch than during the previous year. The star-route mileage has increased over 5,000,000 miles and the railroad mileage over 11,000,000. The railway postal clerks have reduced the number of pieces usually sent to the Dead Letter Office by 2,000,000. By encouraging postmasters in free-delivery cities to prepare supplementary directories and by general suggestions to the public through the newspapers to take greater care in the direction of matter, the Dead Letter Office expects a reduction of its labors by at least one-third.

I shall have the honor to advocate this year, as last, with whatever persuasiveness it is possible for me properly to use, certain measures, legislative and administrative, which I believe to be for the benefit of the service. If some of them fail—as it can not be hoped that all will succeed at once—there will at least be the benefit of the inquiries, the discussions, and the collection of opinions. The postal-telegram bill I again respectfully commend to your attention and to the favor of Congress. The recommendation that the

Growth of the
Department.

Recommendations and needed reforms.

postal-savings experiment be fully and fairly tried is again renewed. The discussion of the eight-hour question can not be shirked; I hope the postal clerks will be certain during the next year who their friends are. The questions whether the division of the country into postal districts for the better instruction and encouragement of postmasters, new and old, and whether an additional permanent officer of the very highest order of experience and originality would not be a good thing for the Department, may well be pressed. Within the Department itself many reforms can be worked out, but only slowly, partly because legislation is necessary and partly because even small revolutions are not desired by all. In the matter of simple and uniform accounting the coming year ought to show excellent results. I hope to see the civil-service examinations, especially with reference to the railway mail, improved; for only in proportion as these yield the most efficient civil servants can the benefits of the civil-service system be extended. The whole post-office clerical force needs to be scanned thoroughly with a view to Congressional action looking to its better classification.

I feel that, while the postmasters, the railway-mail people, the contractors, and all the officials and employes of the postal system are perhaps better in touch with the Department than they ever were before, a still better common spirit and purpose can be infused. I believe that the officials and employes all agree with me that the quickest, the most accurate, and the most frequent service is not only desired, but is rightfully expected by the public; and I believe I am not wrong in saying that the organized bodies of business men, as well as the editors and the citizens generally, are more watchful for the shortcomings of the service than ever before, which is surely a very encouraging condition of affairs.

A QUICKENED SERVICE.

This one idea has dominated the Department this year: to make the mails go faster, more safely, and more frequently. The fifty-eight thousand six hundred and sixty-eight schedules of the railroads and the star and steamboat routes have been studied, readjusted, and extended.

Quick connections; early trains; loyal service.

While we are only at the beginning, with an enormous work yet to be done, there is satisfactory progress. The railroad and transportation officials are in most instances ready helpers. Delays in connections are being removed; early trains to accommodate newspaper mails are provided whenever possible, and due care is taken to collect, deliver, and

close mails according to the particular needs of respective communities. These matters are not suffered to drift to their own level, but are the subjects of careful thought and consultation with committees and communities, and have the personal direction of officers of the Department. The new postmasters are in the main working splendidly, and there is a spirit of loyalty and devotion throughout the ranks of postal employes, notably in the Railway Mail Service, which the best postal authorities declare to be in better shape than it has ever been before. In a number of cities boards of trade and local committees have rendered important aid to the Department in adjusting the service to the better satisfaction of the public.

Mercantile bodies assisting the Department.

I submit a few illustrations of the enlarged service in the West. In fifteen months 1,149,706 miles of mail service were added in the State of Washington alone. Four years ago the service was not so large by 1,000,000 miles. In Wyoming in fifteen months have been added about 80,000 miles of service, and in Idaho in fifteen months about 160,000 miles. The last letting of contracts for star service in the fourth contract section, which embraces the country between Arkansas and California, shows the following:

Increased service in the West.

Annual rate of expenditure:

June 30, 1890 (old service).....	\$2,067,651.24
July 1, 1890.....	1,853,976.89
Decrease.....	213,674.35

Number of miles traveled per annum:

June 30, 1890 (old service)	29,444,693.49
July 1, 1890	31,232,515.07
Increase	1,787,821.58

The examination of all the postal routes, whether they traverse railways or steam-boat or stage lines, has resulted in many improvements, a few of which I beg to refer to. A morning mail from New York reaches Boston at 12 m. instead of 3.30 p. m., and not only benefits the latter city by so much, but makes earlier connections for New Hampshire and Maine. The fast mail from the west is delivered in Boston a business day earlier than formerly. The New York and Chicago mail is delivered at 10 o'clock a. m. instead of in the afternoon or the next morning. Similar arrangements of schedules and similar benefits to all the intermediate region can be shown between Philadelphia, Pittsburgh, Chicago, and St. Louis. The transcontinental mail referred to last year as saving a day, has been main-

Time saved in many places.

tained successfully, and its benefits have been extended to all the country tributary to the railroads traveled. A fast mail between St. Louis and Kansas City permits a delivery of commercial matter in Kansas City in the forenoon instead of in the afternoon after banking hours, and early schedules out of Kansas City practically advance deliveries throughout the State of Kansas by three hours. Five hours have been gained between Chicago and New Orleans, and it is possible that the schedule may be shortened four hours more. Many western mails out of St. Paul have been advanced two hours. New schedules are under consideration reaching from Boston to New Orleans by which all of the intermediate country will be benefited and business men at either end will gain a day.

Added facilities on one-fifth of R. P. O. lines.

Between September, 1889, and October 23, 1890, the full railway post-office cars have been extended over 5,105 miles of additional railroad routes, and the full railway post-office cars already existing have been enlarged on 12,783 miles of railroad, while the apartment lines have been extended (new) on 4,434 miles and enlarged on 5,723 miles of existing railroad. The efficiency and rapidity of the railway post-office mails have been improved on every line, and on one-fifth of the lines facilities that never before existed have been supplied. Running into and from Chicago, upon all the different railroads centering there, we have fifty-six daily railway post-office lines upon that number of trains—that is, fifty-six incoming and fifty-six outgoing. This is an increase of four lines during the past year. The aim of the railway-mail service is to make schedules that leave the large mailing centers after the close of business and arrive early in the morning so as to deliver before business begins.

City distribution on trains.

The development of city distribution on trains so as to avoid delay after arrivals is indicated by the following enumeration of pieces of mail advanced thereby:

1889	102,718,818
1890	231,429,375
Increase (say 30 per cent.)	59,710,765

"Nixie" matter sent home.

This improvement will be still further developed this year. Besides, during the past year 4,628,931 pieces of mail were taken from the railway post-office lines imperfectly directed, of which by later treatment 2,186,933 pieces, or 47 per cent., were sent home. This kept out of the Dead Letter Office more than 2,000,000 pieces of mail matter.

The total increased length of mail routes in 1890 was

11,831 miles. The miles traveled increased in 1890 by 16,507,609, and were distributed in part as follows:

	Miles.		Miles.
Texas	575, 124	Montana	156, 916
Indian Territory.....	270, 070	Wyoming	78, 985
Virginia*	1, 588, 506	Arizona	33, 799
Georgia	346, 176	Utah.....	68, 869
Florida.....	164, 475	Idaho	124, 413
South Carolina	130, 520	Oregon.....	179, 270
Mississippi	258, 037	California.....	164, 452
Arkansas.....	105, 091	Washington.....	323, 283
Dakota.....	199, 490		

The star-route mileage traveled has increased 5,383,318 miles. The railroad mileage traveled has increased 11,523,191 miles. The total number of mail routes June 30, 1890, was 27,105, an increase over the previous year of 1,444. The total number of miles traveled per annum was 327,409,493. ^{Increased star and railroad service.}

THE QUICKEST SERVICE NOT YET ATTAINED.

The swiftest mail is not fast enough in these days for all the needs of commerce and social correspondence. The conviction steadily grows upon me that the post-office should do more than employ fast mails and stage coaches, and that the electric wires should carry letters; that the people who pay in postage rates the cost of the postal system have a right to the use of the postal plants as a means of reducing the cost of telegraphic correspondence and for the instant transmission of postal money-orders. We strain every muscle and nerve trying to gain an hour two on this collection or that delivery. We worry the railroads with importunities for new trains or faster ones that shall save perhaps three or four hours to the business men and the letter-writers. All the while its quickest service, by which electric letters under some of the new systems might be transmitted and whole days or whole nights be gained and saved, is kept out of the reach of these who are doing days' work or are just beginning to be capitalists. ^{The people have a right to postal-telegraph service.}

There are mail routes of thousands of miles in the new States and thinly settled parts of the older country where every mile entails a certain loss to the Department; but the priceless privilege of communication by post is maintained though every other channel of intercourse is closed. The postal service, with all its long-distance and unprofitable service, burdened with the cost of doing without charge the

* This large increase was occasioned by the addition of 428 miles of railroad lines

mailing business of all the other branches of the Government, loaded down with the newspaper and book mail which it carries at about one-sixth of the actual cost, is nevertheless nearly self-supporting. It has therefore proved itself able to manage successfully the telegraph business in connection with the postal system and as a part of it.

Certain limited classes are against this consolidation, but the masses of the people are strongly for it. It is not possible to take an accurate census of those favoring or opposing it, but any disinterested person may discover the trend of feeling that has set in. That man must be willfully blind who does not see the vast and rising tide of public sentiment against monopoly. Here is a purpose of the people, and no man or set of men can turn it aside. In one form or another the public imperatively demands cheaper telegraphy, and the Post-Office Department can supply it at less cost than any corporation, unless the latter has rent, light, and fuel free, and carriers and clerks without pay. It has been argued that it is not the business of the Government to operate the telegraph; but the Government of this and every other country controls the mail service and stoutly claims that the general welfare is promoted by managing the transmission of correspondence. In pursuing that object it puts on mails at great cost, cheapens postage, and constantly adds facilities for ready communication. The general welfare will be similarly promoted by going one step further and giving the quickest of all modes of communication, namely, cheap telegraphic facilities, as it does mails, at points not profitable for private capital to reach, as well as at all other points. If mails were only run to self-sustaining or profit-making points the extent of the service would be cut off 40 per cent. The postal system is not a scheme for profit. If it were, newspapers and books would pay their proportionate cost and either a large annual surplus would appear in these reports or the free delivery would be extended universally. The postal service is the Government's kind hand, protecting and promoting the correspondence of its people, and communication by telegraph as well as by mail is essential to its best development.

Public sentiment strongly favors a postal telegraph.

Objections continued.

An objection urged by the above-referred-to class of persons against the assumption of any telegraph business by the Government is that the telegraph would be in the hands of the party in power, and liable to corrupt use in times of political excitement. This is more specious than sound. The postal service is in the hands of the party in power, and liable to the same abuse. Stringent laws and

penalties hedge around the postal system, jealous eyes watch it, and it is ever open to public observation and inquiry. The telegraph business, in the hands of private individuals, is not so hedged about, and is much more likely to be used for corrupt purposes.

Another specious objection is that the Government ought not to compete with existing companies. But the people have rights and interests as well as the telegraph companies. In 1866 it was proposed to assume control of the telegraph lines; but it was then held by these companies that they should be permitted to realize some profit on their investments, and by act of Congress five years were allowed for that purpose, since which time the people have paid rates (in many cases and at many points excessive) that have earned over \$100,000,000, which has been divided among stockholders or added to telegraph plants. The companies have been permitted to enjoy these valuable franchises for a quarter of a century instead of five years. Even now it is not proposed to take these properties out of the hands of their owners, but to open to them and to the public the privilege of bidding for telegraph service on a modified scale, which will not, it is practically certain, interfere with the service now existing.

It is sometimes maintained that the telegraphic service can be performed more cheaply by private hands. If this objection is good, it holds against all kinds of Government work. The public revenue ought to be collected by private hands. The laws ought to be administered by contracting parties. A banking firm ought to manage the Treasury, and the postal business should be handled by a syndicate. The question is, what is the best and safest for the public interest, as well as what can the general public afford to use? No one believes that the mail service would have been so widely extended by any private corporation that had to pay dividends to its stockholders. One-cent postage would never come if the post-office business were in the hands of a money-making corporation. It is for the interest of a private company to extend its business only so fast and so far as it is profitable; it is the aim of the Government to extend its service wherever it is actually needed. These further objections are made: Large outlays of money and an increase of Government patronage. Both fall to the ground, because, under the plan proposed, it is not intended to buy or build telegraph lines, but to contract with existing companies, or such as may hereafter be established; and such contracts would provide

The mail service would not have been extended by private corporations.

not only telegraphic lines, but instruments and clerks to operate them, except at small offices, where the postmaster or one of his clerks would also be paid by the telegraph company to act as operator. Therefore, there could be no drafts on the Treasury or additions to the civil list, except as the general service grew—and it is growing every day now. The contracting telegraph company would furnish lines, instruments, and operators, and transmit the messages at rates fixed by the Government, all of which would go to the company, except two cents per message, which would be retained by the Post-Office Department to cover its expense in collecting and distributing.

In brief, this is the plan proposed. There would be no outlay of money, no appointments of clerks, and no financial liability. The persistent misstatement of the facts at the outset led to some misunderstandings on the part of a small portion of the public. The actual plan is surely entitled to a just statement and a fair consideration. If there

Organized capital and labor approve.

is a better one, it will be quickly discovered and adopted. Many boards of trade, chambers of commerce, and trade and labor organizations throughout the country have, during the past year, passed resolutions demanding postal telegraph in this or some other form. The subject was considered by the Committee on the Post-Office and Post-Roads of the House, but was not acted upon beyond granting hearings to the parties interested. The Committee on the Post-Office and Post-Roads of the Senate reported the bill unanimously.

The English system a success.

A few facts from the last official report of the postmaster-general of Great Britain, dated August 11, 1890, controvert the somewhat accepted opinion that the English system of postal telegraphy is a great expense to the Government and a failure. The increase in the number of inland and foreign telegrams was 8.5 and 8.1, respectively. The number of telegrams on the business of railway companies, transmitted without charge by the post-office under obligations incurred when the use of their systems was acquired by the Government, increased nearly 17 per cent. Press telegrams are transmitted at very low rates and at considerable loss to the revenue. In spite of this free and losing business, however, the English postal telegraph was practically self-supporting in 1887-'88, showed a large profit in 1888-'89, and cleared over \$500,000 in 1889-'90. This, to be sure, is making no charge for interest on the outlay; but it may be answered that the full interest on the cost of the plant can not be fairly charged to the expense account, be-

cause, as is universally admitted, the Government paid an excessively high price for the old telegraph lines.

The relation of the receipts and expenditures of the English system during the past three years is given in the following table:

Year.	Receipts.	Expenditures.
1887-'88	£1,992,949	£1,999,033
1888-'89	2,129,965	2,041,361
1889-'90	2,363,636	2,262,310

It is to be observed that the business of the English newspapers, as well as the foreign, railway, Government, and ordinary business, was done, and done acceptably, though at a loss to the revenue; and it may be repeated that this real Government telegraph system, in spite of its large free and under-cost business, pays its way, leaving a gradually increasing surplus to be applied to interest account on the investment, which is unusual in Government works. The telegraph scheme which I advocate could never fail to pay its way from beginning to end, because the very fact that a postal-telegraph stamp had been put upon a telegram would imply that the expense of collecting, transmitting, and delivering the telegram had been paid in advance. The limited plan, in other words, collects as it goes for exactly what it does. To draw another parallel from the English system, which is necessarily not so free from the red tape of Government control as the contract scheme would be in this country, it may be pointed out that the general telegraph business, whether commercial, social, or press, could be handled more expeditiously than under the present entirely private system, because the delay in accounting would disappear with the advent of the postal-telegraph stamp.

The American plan would certainly be successful.

SAVINGS-BANKS AT POST-OFFICES.

The Post-Office Department is continually urged to act as the guardian of moneys for people resident in parts of the country where savings-banks do not exist. It is not the large cities that feel this need, though even at the populous centers banking institutions generally do not offer convenient hours for working people and do not care to deal with small sums. It is the large mass of wage-earners outside of large cities that clamor for help to keep hard-earned gains. In some of the States no laws exist to give

Department urged to establish savings-banks.

State protection to savings deposited with private capitalists. It is stated on reputable authority that in one portion of the country containing twelve millions of population there are not as many places of deposit for the saving of small sums as exist in a single city of 80,000 people in a New England State.

To teach economy and thrift as leading up to better citizenship falls short if there is no adequate provision for the safe-keeping of savings. Such places ought to be within an hour's walk of the home of every workingman. They can not be left to private capitalists to provide, because it would not pay them to deal in small sums or perform the necessary labor. The post-offices and the postmasters are in every respect rightly situated to do this work. It would be a great comfort to the people to have these banks that could not be affected in times of financial panic.

Savings banks
abroad.

Of all the great powers in the world the United States and Germany alone are without postal savings-systems. The last report of the British authorities shows that on the average one person out of every eight in the United Kingdom is a depositor in the postal savings, and, while in England and Wales the average balance to each depositor is almost \$70, in Ireland, where the conditions are harder, the average balance to each depositor is close to \$94, owing doubtless to fewer opportunities to invest or deposit money for safe-keeping.

In Mr. Lacey's report to the Forty-seventh Congress, urging the establishment of postal savings-banks, he quotes as follows from the twenty-sixth report of the postmaster-general of the United Kingdom :

Notwithstanding the dullness of trade and the deficiency of the harvest that characterized the year 1879, it is satisfactory to report a continued excess of deposits over withdrawals and an increase in the balance due to depositors of upwards of a million and a half sterling. Most remarkable, perhaps, is the progress shown in Ireland, considering the severe distress to which many parts of that country have been subject. For the whole of Ireland there was, including interest, an increase in the balance due to depositors of \$457,915, and of this amount the eight counties chiefly affected by the distress contributed no less than \$127,090.

British savings-
banks.

The postmaster-general of Great Britain states in his last report that the number of savings-bank depositors last year was 8,101,120, an increase of 560,495 persons, and that the total amount of deposits for the year was a fraction under \$100,000,000, nearly \$4,000,000 more than the previous year. In one day over 55,000 persons made deposits amounting to over \$685,000. There were 924,010 new ac-

counts opened in 1889 and 637,128 closed. The total number of open active accounts at the end of the year was 4,507,809, or nearly 300,000 more than the previous year. The report gives interesting data of the growth of the savings-system in the British provinces. In Ceylon the system was established in 1885 and "proved a boon to the poorer population."

An interesting statement in the Bankers' Monthly for October says:

But the greatest extension of savings-banks has been brought about by the introduction of the system of post-office banks. In India, as in England, the use of the already existing machinery of the post-office has not only proved of the greatest advantage in point of economy of administration, but has been of the utmost service in extending the opportunity of profitably exercising thrift into many parts of the country where otherwise it would be impossible to afford such accommodation without incurring a cost too great to be borne by the business of the district. * * * In March, 1888, the totals of accounts and balances in the various savings-banks were as follows:

	Accounts.	Balances.
		<i>Rupess.</i>
3 presidency banks	39,403	11,518,784
12 railway banks.....	12,848	2,296,501
170 military banks.....	18,303	1,473,783
5,966 post-office banks.....	261,157	50,488,357
Total	331,711	65,777,375

The last French report at hand is that of 1885, which shows the amount of deposits to be over \$53,000,000. In Belgium the depositors at the close of 1888 had \$50,000,000 to their credit. In the Netherlands the deposits were upwards of \$5,800,000. In Sweden at the close of 1887, the depositors, 59 per cent. of whom were minors, had \$766,430 to their credit. Comparison of the deposits in 1887 with those of 1884 shows an increase of over 100 per cent. A report of the postmaster-general of the Hawaiian Kingdom dated February 11, 1890, shows that that country first had postal savings in 1886, and has now 2,641 depositors, with \$909,613 on deposit, against \$477,475 one year before. It would seem as though the United States should not be the last country to offer assistance to the masses of her people struggling to rise by thrift and economy.

I recommend that the Post-Office Department be authorized to establish postal savings-banks under regulations formulated by the Postmaster-General; that the said banks be located as follows: (1) In States having no laws regulating savings-banks; (2) in any other States upon peti-

Now plan for
postal savings-
banks.

tion of a considerable number of residents of any one locality; and (3) not more numerously than one post-office for every 10 miles of area; that the interest to be paid depositors shall be fixed by the Secretary of the Treasury at the beginning of each year, and be one-half of 1 per cent. less than the average rate paid to depositors by private bankers; that all postal savings received within a State shall be placed on deposit with the national banks of that State, on application, in such amounts and at such interest as the Secretary of the Treasury shall prescribe, and that all such deposits be declared by special enactment preferred claims against the banks holding them.

LOTTERIES AND THE MAILS.

Lottery instructions issued.

The new act of Congress concerning lotteries accords with the recommendations of my last annual report. The intent of the law is to shut out all lottery business from the mails. Power is given the Postmaster-General, as the executive of the Department, within the limits of the constitution, to exclude all such matter. Quick action was taken the day after the enactment received your signature to close the mails against this business. Each of the 62,401 postmasters and the inspectors has been officially notified of the terms of the act, and the Department has issued regulations to govern their procedure in executing the law. The two months that it has been in operation are too short a time to produce results, but there is satisfactory progress. The lottery companies can not but see that there is to be no trifling or evasions in dealing with them. The press has aided the Department by its very general approval and the public at large have seconded its efforts to make the law effective. The Attorney-General has directed the prompt prosecution of all who violate this law.

Other schemes of chance.

Schemes for the distribution of prizes by chance, most of them of a local nature, and some of them connected with charitable and religious organizations, and commonly termed innocent, have clearly come within the prohibitions of the new law, and consequently the newspapers and other publications containing advertisements of them have been unmailed. The Department, however, has not applied the law harshly in these cases, but where the notifications of the violations of the law have been met in a resentful spirit, accompanied by a refusal to omit the objectionable advertisements, no alternative has been left but to bar from the mails all such matter.

The business of the New Orleans post-office has fallen

off one-third. The registered mail addressed to the Louisiana State Lottery and money-orders drawn to its order have been almost discontinued. While this class of correspondence seems to be disappearing from the mails it is noticeable that one lottery company invites correspondence and remittances by the several express companies, and announces that the agents of said companies will distribute circulars and receive money for tickets. The United States Express Company has taken the lead in declining all lottery business and has so instructed its agents. The Adams Express has followed in the same direction. Certain other express companies, operating mainly in the southern and western territory are alleged to be using their organizations to defeat the purpose of Congress in enacting this law. I have preferred to wait a reasonable time for the voluntary withdrawal by these corporations rather than proceed under the sections of the Revised Statutes that prohibit express companies under penalties and conditions to carry letters or packets over post-routes established by law or between places regularly supplied with mail. I am informed that the acceptance of the business of the lottery companies is a clear infraction of a penal statute, and at the proper time, if occasion requires, I shall bring all this to the attention of the judicial department of the Government.

Decrease of postal business at New Orleans.

Attitude of express companies.

The provisions of the lottery act have been held to apply to circulars, pamphlets, newspapers, and other publications coming into the United States from foreign countries precisely as they do to such matter found in our domestic mails. There is nothing in the stipulations of the Universal Postal Union or in the separate postal conventions with adjoining countries that requires the United States to treat foreign mails in any essential respect differently from domestic mails, certainly nothing that obligates the transmission or delivery of anything declared to be unmailable by the laws of this country relating to the postal service. Further negotiations may be required with one or two international neighbors with the view of suggesting corrections in their laws concerning the sending of circulars at transient printed rates under seal so that their contents can not be inspected, their present statutes having resulted in flooding the United States with sealed letters mailed and transmitted as circulars.

Applies to foreign papers.

It has also been held that the advertisement of the sale of certain premium bonds, issued by European and other governments, is prohibited by the provisions of the lottery act. The payment of these bonds is based upon two or more conditions: 1st. That drawings are to be held at stated inter-

vals to determine what bonds, principal, and interest, of a given series shall be paid at a subsequent date, which drawings are repeated at such intervals until the payment of the entire series is provided for; and, 2d. That the holders of the bonds thus designated at a portion of these drawings shall receive a ticket which will entitle him to certain premiums or prizes in addition to the face value and interest of the bonds, which are to be determined by a subsequent drawing for the distribution of said prizes.

It is legitimate for a government to issue evidences of debt, and to provide for the payment of them at different times, by selecting in the manner described the securities that will be first redeemed; and if the plan stopped at this point the advertisement of it would clearly not come within the prohibition of the act. The ruling of the Department to this effect has been given in a number of cases. But when a scheme for the distribution of a list of premiums of different values, determinable by lot or chance, is ingrafted upon the original plan of payment and incorporated in the bonds as a part of the condition of sale, it certainly converts the whole scheme into a lottery, which, in its broadest sense, is defined to be "a distribution of anything by lot," and in law a scheme "for the distribution of prizes by chance." The Department has ruled that the sales of premium bonds, on the terms mentioned above, could not be advertised in newspapers, nor could the list of premiums or prizes awarded at said drawings be published.

As before stated, the lottery act has been in existence so short a time that its effect in suppressing the lottery evil can not now be fully stated. I believe that it will accomplish all that was expected of it, and that each of its provisions dependent upon executive action can be made effective. The action of the courts in test cases that must necessarily be begun can not be anticipated; but it can be safely predicted that if the law be sustained our mails will be purged of what has long been conceded to be a most demoralizing element.

"CENSORSHIP" OF THE MAILS.

Indecent Literature.

The discussion of the anti-lottery bill and the exclusion of certain literature from the mails have caused a good deal to be said during the past few months about a censorship of the mails, so called; and, lest people who believe in fair play and a just administration of the law should find themselves still misunderstanding the course of the Depart-

ment with reference to these two questions, I beg to submit a few facts. It has been explained elsewhere that the intention is to enforce the spirit as well as the letter of the anti-lottery law. That is also the purpose with reference to the laws regulating the circulation of indecent literature. The whole truth is simply this: No line of action that is not reasonable will stand the test of discriminating criticism, and fair-minded writers and fair-minded readers understand this.

An act of Congress passed March 3, 1873 (R. S., section 3893), provided, "That no obscene, lewd, or lascivious book, pamphlet, picture, paper, print, * * * shall be carried in the mail;" and further, that any person who should knowingly mail or cause to be mailed, or who should knowingly receive or cause to be received, from the mails articles before declared to be non-mailable should be deemed to be guilty of a misdemeanor, and liable to a fine of not less than \$100 nor more than \$5,000, or to imprisonment at hard labor for not less than one year or more than ten years. The statute on the subject of exclusion. It was soon found that it was not enough merely to provide for the exclusion of "obscene, lewd, and lascivious" publications, but that publications which were simply "indecent" had also better be excluded; and accordingly Congress, by the act of July 12, 1876 (19 Stat., p. 90), extended the prohibitions by adding thereto the words, "or other publications of an indecent character," and by forbidding not only the carriage of such matter in the mails, but "the delivery of it from any post-office or by any letter-carrier;" so that the statute was amended to read as follows:

Every obscene, lewd, or lascivious book, pamphlet, picture, paper, writing, print, or other publication of an indecent character * * * is hereby declared to be non-mailable matter, and shall not be conveyed in the mails, nor delivered from any post-office, nor by any letter-carrier.

The statute was thus broadened by prohibiting the transmission of any matter offensive to modesty, or tending to subvert respect for decency and morality, first by constituting the Postmaster-General the judge of the character of such matter to forbid its carriage in the mails (which could only be prevented by executive order), and second by leaving to judicial action the duty of imposing penalties.

It does not matter whether or not a given publication presented for mailing appears, by complaint or otherwise, to a postmaster to be "obscene, lewd, or lascivious," if it does appear to be "indecent." He is obliged, in order not to become a law-breaker, to refer the questionable point to

Postmaster-General obliged to act when applied to.

the proper Department official. It does not matter, when the referee considers the question, whether the given publication is merely "obscene, lewd, or lascivious." If it is simply indecent, he must exclude it or break the law. A translation of a questionable book was, as a matter of fact, presented some months since at the post-office in a Western city for transmission in the mails. It was held and referred to this Department. The Assistant Attorney-General, finding it indecent under any definition of the word, issued an order excluding it. To exclude the book was the simple duty of the Department. For myself I never discuss the policy or wisdom of breaking the law, and the officials of the Post-Office Department do not.

Some have said that the exclusion of a book only draws attention to it and makes the damage caused by its sale the greater. That, as I conceive, is no affair of a sworn public official. Moreover, the "advertising" which it is held the Department gave the objectionable publication was entirely due to the thrifty bluster of the publisher who, however much he complained of the injustice of the decision of the Department, never appealed to the Postmaster-General to have it reversed. The question is not pertinent, either, why the Department does not exclude certain other publications from the mails which are admitted to be indecent. It treats these cases only as they are brought to its attention; and one complaint is considered as carefully as another. To try to pursue any other policy—to try to find publications which on one pretext or another might be excluded—would be to try to establish a real censorship of the mails, which is entirely foreign to what I conceive to be the duty of the Postmaster-General.

THE SAFETY OF MAIL MATTER.

1,223,444 pieces of registered mail matter, valued at \$1,114,491,446.07 were forwarded for the Post-Office and Treasury Department. It is not practicable to state accurately the value of the remaining 13,723,637 pieces of registered matter transmitted for the public during the year, but such value may be to some extent estimated by taking as a basis of calculation the known or supposed contents of the 1,951 pieces reported to have been rifled or lost. The aggregate amount of the inclosures for these 1,951 pieces is reported at \$24,116.57, an average value per piece of \$12.36. By computing the 13,723,637 pieces at this rate, the result is \$169,624,153.32. This is without much doubt an underestimate. This sum added to that of the official

Value of registered mail.

values given above creates a total of \$1,284,115,599.39. The net loss amounted in all to \$14,411.86, or $\frac{11}{1000}$ of 1 per cent.

As to the ordinary mail matter, it is just as difficult to determine its value, because there are no declared values, and it is the business of the officials not to inquire what letters contain. It is interesting to know, however, that the average value of the money letters opened in the Dead Letter Office was \$1.65; of the letters containing postal notes, \$1.51; and of the letters containing negotiable paper, \$55.07. By taking into account all letters opened in the Dead Letter Office, the average value per letter is found to be a little more than 25 cents (25.2). It is estimated that there are carried in the mails 1,854,667,802 ordinary letters per annum, these figures being based upon the general count of mail matter made for one week in May last. At the rate of 25.2 cents per letter the value of the ordinary letter-mail of the United States for one year would be \$467,376,286.10.

There has been no loss at all in the Department proper. The total supposed losses of ordinary mail throughout the United States, as reported by the office of the Chief Post-Office Inspector, amounted to 51,745 pieces. Of these 20,900, or 40 per cent., were packages, the remaining 60 per cent. being letters. The total losses ascertained to be due to carelessness or depredation of postal employes number 23,985, 60 per cent. of which would be 14,391. Assuming the average value to be 25.2 cents, the total ascertained loss of ordinary letters chargeable to the postal service would be \$3,626.53, or $\frac{77}{10000}$ of 1 per cent.; and it is a cause of sincere congratulation that the practical termination of the lottery business as conducted through the mails will in great measure remove from postal employes the temptation to steal letters.

The following is the best evidence at command of the character and integrity of postmasters. It is an extract from a letter written at my instance by the Auditor of the Treasury for this Department:

NOVEMBER 15, 1890.

HON. JOHN WANAMAKER,
Postmaster-General:

SIR: I am verbally requested by the Chief Post-Office Inspector to prepare for your use a statement of the number and amount of defaults to the United States of postal and money order funds by postmasters during the period from April 1, 1889, to the present date.

REPORT OF THE POSTMASTER-GENERAL.

I am of the opinion, as previously stated, that, so far as the results of collection of debts arising out of the business of the past year has progressed, it may be safely asserted that no defalcation, resulting as yet in actual loss to the Government, has occurred in either postal or money-order transactions.

Respectfully,
(Signed)

T. H. COULTER,
Auditor.

THE FOREIGN MAIL SERVICE.

Estimated profit from foreign mails.

The revenue from all sources for service to foreign countries can only be determined by estimates based upon weights of mails and statistics gathered during the first seven days of October and April last. The aggregate sum seems to be \$2,655,108, and the actual net cost of the service is \$573,882, showing a profit of over \$2,000,000, exclusive of the cost of transportation from points of origin to the exchange post-offices. This cost can not be ascertained from any existing data, as it forms a part of the general mail in transit from all points. For the facilities afforded by the transportation companies named as miscellaneous service in the table of the report of the Superintendent of Foreign Mails, comprising the lines of steamers to the Latin-American countries, the compensation allowed under the law is inadequate for the service performed.

Australian mails.

Mail connections with the Australian colonies have been maintained with difficulty, owing to the disposition of the New Zealand Government to terminate the present arrangement on account of the alleged inadequacy of the compensation allowed by this Government, viz, the entire amount of postage collected. The Department can only act within the statutes, and the subject in detail has been laid before the Committee on the Post-Office and Post-Roads of the House of Representatives, whose chairman introduced a joint resolution which reached the House Calendar. Meanwhile the New Zealand Government has submitted to the contractors (the Oceanic Steamship Company) propositions for the continuance of the service for one year, the acceptance of which by the company probably depends largely upon the fate of the bill now before Congress in favor of American shipping and the joint resolution above referred to. I consider the matter of sufficient importance to the postal and commercial interests of the United States urgently to recommend that it receive prompt and favorable action.

Foreign parcels post.

The parcels-post service continues to increase with foreign nations which apply for facilities to get our products. During the year postal treaties have been concluded with

Costa Rica and the Danish West India Islands. The limits of samples of articles have been increased for Italy under the rules of the Postal Union, and the range of mailable articles has been extended. The Fourth International Postal Congress will assemble in Vienna on the 20th of May, 1891, to revise the existing convention and regulations of the Universal Postal Union. The United States is entitled to two representatives.

Negotiations instituted by this Department with the postal authorities of Great Britain, Germany, and France were conducted by William Potter, esq., of Philadelphia, as our representative. A personal visit was made to the postal bureaus of these three countries, and while the postmasters-general of Great Britain and France were unable to enter into arrangements with the United States to establish sea post-offices for the purpose of assorting mails in transit, the postmaster-general of Germany made a preliminary agreement for such offices on ships sailing between New York, Bremen, Hamburg, and Southampton. The effect of the new service will be to save the time required at the New York office for assorting these foreign mails and for preparing them for distribution. The authority and the appropriation for inaugurating this service was given by Congress June 30, 1890. The adjustment of the details to put the service into operation has been found to be impossible by correspondence, and a representative of the German postal service has been ordered to this country for the purpose. Mr. Potter's valuable services were rendered at his own expense and without desire for compensation. His report in full is printed as an appendix to this report.

Sea post-offices
between United
States and Ger-
many.

CARRYING THE FOREIGN MAIL.

The Department is wholly dependent upon steamers flying the flags of other nations and of foreign ownership for the transportation of the mail. Exceptions are the Pacific Mail S. S. Co., the Oceanic S. S. Co., the U. S. and Brazil Line, and The Red "D" Line. The total amount paid to all the other American companies is only \$10,955.97.

United States
dependent upon
foreign capital-
ists for trans-
portation of for-
eign mails.

Unexpected differences with steam-ship companies of foreign registry relating to charges, or for other causes, might at any moment cut off mail intercourse with Europe under the present circumstances. It must be apparent that this country should not be subject to foreign capitalists for means to distribute its mail. Without considering the inland charges on the foreign mail, the sea service shows a

profit of not far from \$2,000,000 per annum, which you might be fairly considered for disposed to the encouragement of American shipping for American mails.

I have examined Senate bill No. 3733, now pending in the House, "To provide an ocean mail service," and believe it to be for the interest of the postal service to have such a bill become a law. In considering the subject at the request of the Committee on the Post-Office and Post-Roads of the House of Representatives I had the honor to submit the following amendments, which, I understand, were approved by the committee:

Amendment of Senate bill.
 Sect. 5. And that the total amount of compensation to be paid for such ocean mail service over and above the net revenue for the sea and United States inland postage received on the mails so conveyed shall not be a charge upon the appropriation made for postal service for the Post Office Department, but shall be paid out of the Treasury of the United States upon vouchers properly issued and certified under and by direction of the Postmaster-General.

Sect. 6. The United States shall be entitled to one or more messengers who shall have transportation and subsistence free of charge.

It does not seem proper to put down to the cost of the postal service appropriations of Congress to promote commercial intercourse and build up a branch of the American Navy, to which the mail service is but an incident.

LOWER RATES ON FOREIGN LETTERS.

The present rate of postage is 5 cents for each half ounce to all points throughout the world, the exception being the Australasian and Cape colonies, where the rates are 12, 15, and 19 cents on half-ounce letters. By their own acts these countries are not in the Postal Union. Almost all the countries grade their postage by distances, and no country offers a uniform rate, or as low a rate, as the United States does. Considerable discussion has gone on throughout the year of a proposition to reduce the foreign rate to the domestic rate, or from 5 cents to 2 cents, the demand arising mainly from our friends in Great Britain, who were represented by J. Henniker Heaton, esq., a member of Parliament, in a visit, most agreeable to the Department, for conference on this subject. Considering that the United States carries a foreign letter from any inland point from the southern boundary of the British Possessions to the northern boundary of Mexico, or from the Pacific to the Atlantic, to the ports of debarkation, and then without any extra charge carries it across the ocean, it would seem that the rate is low enough. I am not averse to a reduction of ocean postage, but quite

Foreign rates are low already.

agree with the general sentiment that any reduction of rates of postage ought to begin with domestic rates.

If the rate were reduced to 2 cents we should be charging the same for carrying a letter from Alaska to India as for carrying a letter from one side to the other of any street of an American city. If the foreign rate were reduced to the domestic rate, 2 cents per ounce, there would be no "sea postage," and consequently, as the statute (R. S., 4009) limits the compensation to be paid to vessels of foreign register for the sea conveyance of United States mails to "any sum not exceeding the sea postage on the mail so transported," there would be no fund available for the payment of vessels of foreign register for transporting the mails; and if the rate were reduced to 2 cents per half ounce, there would be available for this purpose only 2 cents per ounce, and the rate of compensation for sea conveyance would therefore necessarily be reduced.

Reduction of postage should begin with domestic rate.

POSTAL-CARDS WITH PAID REPLY.

The introduction of postal-cards with paid reply, each half of the card bearing a 2-cent postage-stamp, into our international postal service would, in my judgment, prove a great convenience. Under existing regulations the postage-stamps of one country are not valid for the prepayment of postage on articles mailed in another country. Consequently, articles mailed abroad bearing United States postage-stamps are required to be treated as if no postage were prepaid on them. It is useless, therefore, for persons in this country to send United States postage-stamps to their correspondents in foreign countries for the prepayment of return postage; and as the transmission of coin by mail is, as a rule, prohibited, there is at present no convenient way by which provision can be made by persons in the United States for the prepayment of the return postage on their correspondence from abroad. But the regulations provide that the reply-half of a double postal-card issued by any country of the Postal Union shall, when mailed in any other country of the Postal Union addressed for delivery in the country which issued the card, be forwarded to its destination as a fully prepaid article; and hence, if the United States issued such cards, the present difficulty would to a certain degree be removed.

No way to pay return foreign postage on letters.

PARCELS POST.

If the heavy matter put in the mails by the various Departments were sent to the express offices, and if paper-

Express companies have short hauls, Department the long ones.

One-cent post must take precedence.

covered books now carried in the mail under a ruling of the Department at 1 cent a pound were to be unloaded from the mail upon the express companies, where such work belongs, there would be abundant compensation to them at their rates in this transfer of business for what they would lose if the Government extended the limit of weight of mailable packages from 4 to 8 or 11 pounds. Nearly every country in Europe has established a parcels post and managed it successfully to the great satisfaction of the people. The conditions of commerce are much the same all over the world, and if there are no objections from business people in the old countries after years of experience with the parcels post, there would not be objections here after it was fairly tried. It can only be a question of time before it will be undertaken in some better form in this country. The system now in operation allows the express companies to bid under postal rates and get the short hauls, while the long and expensive hauls are left to the Department, whose rates are fixed irrespective of long or short distances. The data obtained by the recent weighing and count of mail matter will show the profit or loss of this particular part of the postal business. Losing the short hauls and doing a business limited to four pounds does not permit the most favorable test. While the post-office buildings in most of the large cities are greatly crowded by the postal business, there is ample room for extension in three-fourths of the offices. The postal cars and express cars are coupled together on the same train, and the same set of men could take charge of both and use the space interchangeably and economically. I am in favor of a full parcels post, but think 1 cent postage on land and sea should take precedence over every large postal departure.

LOSSES ON "SAMPLE-COPY" BUSINESS.

An act of Congress of March 3, 1885, reduced the rate of postage on newspapers and periodicals to a cent a pound when mailed by publishers and news agents, thus permitting the transmission of sample copies at the pound rate. This was intended to benefit only the publishers of unquestionably legitimate newspapers and periodicals, and indirectly the general public; and, under the limitations expressly provided for, the resulting burden upon the postal service would be hardly felt. This special rate for sample copies has presented such a temptation, that thousands have resorted to the subterfuge of converting mere trade circulars, descriptive catalogues, illustrated price-lists, etc., into the semblance of newspapers and magazines, and then,

after securing for them official entry into the newspaper class of mail matter, have circulated them promiscuously and in enormous quantities as pretended sample copies.

The following instance, involving the circulation of only a hundred thousand copies of one of these spurious publications, will show a gain to the publisher by putting his advertising matter into the form of a magazine, and having it admitted into the mails as such, and the consequent loss to the Government from the transaction :

Illustration of
loss on sample
copies.

100,000 copies of publication, each weighing, say, 3 ounces,	
postage on which, mailed separately as third-class matter,	
at the rate of 2 cents each, would be.....	\$2,000. 00
Same number of copies mailed in bulk as second-class matter,	
postage on which at the rate of a cent a pound, would be..	187. 50

Saving to the publishers and loss to the postal revenue..... 1,812. 50

If the amount shown in this example, which I do not think is exaggerated, is multiplied by the number of publications presenting a similar state of things, the result is an annual loss to the Government of about \$1,100,000; and the loss to legitimate publications, whose advertising especially is interfered with, is enormous.

It may excite some surprise that the Department will carry publications of such a character. But consider the facility with which a semblance of genuineness can be given to all this class of printed matter, the somewhat faulty conditions prescribed by law for admitting second-class matter to the mails, and the difficulty of determining the precise nature of such publications without delay and expensive special investigation. Hardly a day passes, indeed, that the Department does not refuse this privilege or withdraw it when granted by mistake. I suggested as a remedy in my last annual report some limitation of the number of sample copies which might be mailed at this low rate, but I am now convinced that this alone would be insufficient, and respectfully recommend the following amendment to the existing law relative to second-class matter :

Amendment of
law recommended.

That hereafter no publisher shall be permitted to mail sample copies of newspapers or periodicals in excess of the number thereof sent at the same time to regular subscribers, except at the rate of postage applicable to transient second-class matter—that is to say, one cent for every four ounces or fraction thereof, payable by stamps attached—every sample copy to be plainly marked as such before being deposited in the post-office for mailing, and to be exactly the same as some regular issue of the publication of which it purports to be a sample: *Provided*, That the right to mail sample copies, except at the rate of one cent for every four ounces or fraction thereof, payable as aforesaid, shall be absolutely denied to any newspaper or periodical the publisher of which guaran-

ties to advertisers or others a specific circulation thereof in excess of the number actually subscribed for or sold, and to all newspapers and periodicals the publishers of which are engaged in any business, except the publishing business, which is directly or indirectly advertised in such publications.

POSTAGE ON PAPER-COVERED BOOKS.

In my last annual report attention was invited to the following abuse in the postal service: Certain publishers have for many years issued paper-covered books in the form of periodicals, bearing a date and numbered in a nominal list or series for the purpose of sending them through the mails, not at the rate with which other books are legally chargeable, but at a cent a pound. These books differ in no essential respect from other paper-covered books, and yet are shipped in the mails in immense quantities at the cent-a-pound rate. The experience of another year has confirmed my conviction of the great abuse involved herein; and I therefore urgently recommend the passage of bill No. 7558, introduced into the House at the last session by Hon. H. H. Bingham. It is intended to subject all books, no matter what their special characteristics may be, to the rate of postage fixed by law for third-class matter, thus:

Amendment
urging making all
books third-class
matter.

That from and after the passage of this act all publications purporting to be issued periodically and to subscribers, but which are merely books or reprints of books, whether they be issued complete or in parts, whether they be bound or unbound, or whether they be sold by subscription or otherwise, when offered for transmission by mail, shall be subject to postage at the rate prescribed by law for third-class matter.

I present again a few of the reasons in favor of this measure that now occur to me: First. The books are not newspapers or periodicals in the commonly accepted sense of those words, or in the sense intended by Congress. They possess none of the characteristics of a newspaper or magazine. On the contrary, these so-called serials or libraries present only the most superficial resemblance to periodicals. Second. An unfair discrimination is made against other books published less frequently than once a month; and again, why should a paper-covered book have greater privileges than a bound book? Third. The loss of postal revenue is very great, for every pound of the books under consideration realizes to the Government just one-eighth of what the law intends to collect.

The practice has opened the door to other abuses. As postage-stamps are never affixed to periodical matter sent at the pound rate, it is impossible for postmasters at the office of destination to know whether postage has

been paid or not, and through negligence or dishonesty matter of this kind may be smuggled into the mails without the payment of any postage whatever. Moreover, many books that have really never been admitted to the second class have slipped through at the low rate by being mailed at places away from where they were published; and again, books of an obsolete series, or reprinted by some other than the original publisher, or not really belonging to the series named on the cover, may get into the mails at one-eighth of the fair and proper rate.

CURIOSITIES OF THE DEAD-LETTER OFFICE.

Pains were taken some months ago to ascertain why so much mail matter continually comes to the Dead Letter Office. The evidences are convincing that the miscarriage and non-receipt of such letters and parcels as reach that office are due in the main to carelessness and omissions on the part of the public, and in very small measure only to any fault either in the system or in the work of the employés.

Of the more than six million and a half of pieces of mail matter received annually at that office, nearly five millions and a half contained nothing of value, and it is almost inconceivable, but none the less true, that about one-half of this number contained no signature which would enable the Department to return them to the writers. They consist in the main of letters from one member of a family to another, or letters passing between intimate friends; and the signature may be, for example, "Mother," "Jack," "Your affectionate sister," or some equally indefinite appellation.

About 5½ per cent. of the whole number, or, in round numbers, 319,000, of all letters opened contained valuable inclosures, either of money, negotiable paper, postage-stamps, or miscellaneous papers and articles. The money inclosures alone amounted to over \$40,000, and those representing negotiable paper to over \$1,400,000. There were nearly 11,000 letters which contained lottery tickets, and nearly 200,000 contained pictures and papers of a character unfit for circulation. These were all destroyed.

Of the more than six and a half million pieces received about one-half a million were of foreign origin and were returned to the countries whence they came. One-fifth of a million were restored unopened to the owners; a million and a half were restored to the respective owners after they had been opened, the information necessary to such restoration having been ascertained from the con-

A large portion of failures to deliver chargeable to the public.

One-half of all undelivered letters not signed.

A million and a half of value in dead letters.

ments. Nearly 366,000 which contained inclosures were returned to the owners, and about three and three-quarter million pieces, on failure after every effort, had been able to reach the owners, were destroyed. Parcels of merchandise unclaimed for two years are annually disposed of at auction. Last year there were offered nearly 20,000 such parcels, the proceeds amounting to \$2,766.53.

Development
of business

If people who use the mails would only be careful to observe a few simple requirements, trifles in themselves, but in the aggregate of vast account, the share of the Dead Letter Office could soon be reduced one-third. All writers of letters may not care to place their names and addresses upon the corner of the envelope, but if they would do so there could be few undelivered letters. Cultivation of the habit of scanning the address of a letter after it has been written would prevent nine-tenths of the mistakes due to deficient or erroneous addresses. It is purely a matter of business habit, and the remedy is the simplest. There is no law or regulation which can require an affectionate sister to place her full name and address in a letter to her absent brother, but if mothers and sisters and brothers would in some corner of the paper do this, there would be a million and a half more letters restored to their owners every year.

Collection of
articles

That the mails are not used solely for the transmission of intelligence is proved by the curious collection of articles of gold, specimens of valuable ores, kid gloves from the wreck of the *Oryza*, imported caliques wrapped in dried herbs to conceal them from the customs officers, Indian pipes and tomahawks and a birch bark canoe, lava from the Modoc beds, cocoons of the silk-worm, agate from Lake Superior, reading cards for the blind, birds' eggs, cakes, fruits, medicines, knives, pistols, rings and watches, live bees, serpents, horned frogs, and centipedes are a few of the articles representing the varied assortment rapidly accumulating here.

THE MONEY-ORDER SYSTEM.

Increased issue
and of money-
orders.

The report of the Superintendent of the Money-Order System presents farther evidence of the tendency shown in late years towards a decrease of the average amount of domestic money-orders, there being an increase of nearly a half a million in the number of orders issued, but a decrease of over \$700,000 in the amount of such orders. This is in con-

sonance with the true theory of the system, which is to provide a means of remitting small sums without interfering with vested banking interests. The postal notes show an increase of a little less than 2 per cent. in number and of over a half of 1 per cent. in amount. In the aggregate the amount of issues of money-orders amounted to nearly \$140,000,000, the same being an increase of 3.68 per cent. over the previous year.

The international money-order business exhibits an increase of over 34,000 in the number of orders issued and of nearly a million dollars in the amount thereof; of nearly 7,000 in the number of orders paid and of over \$350,000 in the amount thereof. These figures show, in contradistinction to the domestic business, an increase in the average amount of remittances from the United States to foreign countries, and an increase likewise in the average amount of the remittances from foreign countries to the United States.

There seems to be no diminution of the steady flow toward foreign countries of the savings of new citizens who find in our own land remunerative fields of labor. As shown in the report in question, it was necessary to liquidate balances abroad by reason of the excess of orders drawn in this country over those drawn upon us to the amount of \$8,353,561.50. Sending their savings home-

The benefits of an interchange of money-orders with this country will be extended, by means of conventions, to the Republic of Chili and also to the Republic of Ecuador. These conventions await only the approval and ratification of the home governments before the business may be begun. Negotiations for a like purpose are in progress with the Republic of Salvador, Central America, and the British colonies of Trinidad and Tobago and of the Bahamas. Money-orders to Chili and Ecuador.

EXPENSES OF OTHER DEPARTMENTS HEAPED ON THE POST-OFFICE DEPARTMENT.

Though the express companies, which oppose the introduction of the parcels post because it would take away from them the transportation of small packages, do not reach many of the interior places that most urge and need the parcels post, they seem to be ignorant of the large express business done for the Executive Departments through the mail. Bundles of trees 6 feet high and 6 feet around, bags of seeds, supplies for the Army, tons of documents packed in wooden cases that sometimes require three men to handle Bulky matter in mails.

Free matter.

them, millions of blanks of the Census Office, are piled into the post-offices when they should be sent to the express offices. The reason for it is, that the Post-Office Department is compelled to carry free anything sent under a penalty frank, and penalty franks are used by all the Departments and their agents for the purpose of carrying everything they choose to send. It does not seem fair to be looking at a deficit in the Post-Office Department to see whether we can afford a reduction of letter postage to 1 cent when the deficit is wholly caused by conducting an express business for other branches of the Government.

Other Departments should pay their share of service.

In the discussion of this subject it is frequently said that it is only a matter of book-keeping; that the Government has finally to pay the bills. True enough; but each Department should be able to explain its operations and not be burdened with expenses not legitimately its own. The only thing the Post-Office Department gets for nothing is the service of the Department of Justice, but the other Departments bear no part of the postal expenses in return for all the postal service does for them free. Seventy per cent. of the work done by the Washington post-office yields no revenue. The Bureau of Engraving and Printing, connected with the Treasury Department, charges for every piece of work done for the Post-Office Department, but the Treasury Department places in the mails 161,000 pieces per annum of registered mail alone, not including a vast quantity of ordinary mail, to be carried all over the United States, for which the Post-Office Department gets no compensation whatever.

The postal service might be self-sustaining.

In view of the constantly increasing transportation of free matter in the mails I submit on another page a table showing its present magnitude, and ask for legislative action to put these charges against the Departments to which they belong. It will be seen that the Post-Office Department is *self-sustaining* when credited with all the work it performs.

FREE MATTER.

The matter mailed free of postage in a year after the ratio of the period above referred to may be classified as follows:

	Pencils.
1. Second-class matter in country of publication.....	30,714, 135
2. Franked matter—books, pamphlets, reports, seeds, etc...	4,373, 646
3. Matter mailed free of postage under penalty envelopes for the Executive Departments of the Government,...	7,103, 228
4. Supplies, packages, etc., mailed under penalty labels of the Executive Departments of the Government.....	27, 641, 026

If postage had been collected on the foregoing the following would be the resulting revenue:

What the postage would have been on free matter at public rates.

1. On 30,714,135 pounds of second-class matter, at 1 cent per pound (per papers in counties).....	\$307, 141. 35
2. On 4,279,646 pounds of franked matter, at 1 cent for each 2 ounces, or 8 cents per pound, rate charged on third-class matter (franked matter, agricultural colleges, Congressional Record)	342, 371. 68
3. On 7,160,228 pounds of first-class matter, at 2 cents for each $\frac{3}{16}$ of an ounce, the rate paid by the public for like kind of matter (letters, Department matter)	6, 026, 047. 88
4. On 27,543,016 pounds of supplies, at 8 cents per pound, the rate charged on third-class matter (other Department matter)	2, 203, 441. 28
Total free matter	8, 879, 002. 19

Of the foregoing the free matter carried for the Executive Departments alone would amount to \$8,229,489.16; and if postage on supplies were charged at fourth-class rates, as charged the public, instead of third-class rates, an additional amount of \$2,203,441.28 would be due. The total official matter would, therefore, yield the Department \$10,432,930.44 annually. In connection with this showing the following deficiencies in postal revenue may be recorded:

1. Year ending June 30, 1890 (estimated in small part) .	\$5, 786, 300. 40
2. Year ending June 30, 1891 (estimated)	4, 928, 033. 55
3. Year ending June 30, 1892 (estimated)	3, 590, 862. 43

APPOINTMENTS AND REMOVALS.

Of the number of postmasters of the first, second, and third classes (Presidential), whose commissions, "to have and to hold the said office for and during the term of four years from" (date of commission), there have been removed in the last two years, or in the last eight months of the term of your predecessor and of the sixteen months of this administration (the period covered by my former annual report and by this report)..... 710

Presidential removals.

Of these there were removed on inspectors' reports. 350
For incompetency and other causes, for the improvement of the service..... 360

Of this last number 219 had served four years or more.

The removals for the past year were..... 557

Of these there were removed on inspectors' reports..... 295

For incompetency and other causes, for the improvement of the service..... 262

Of this last number 174 had served four years or more.

Three per cent. of the whole number of Presidential postmasters and 15 per cent. of the number changed during the past year were removed during the year irrespective of inspectors' reports or of four-year terms on the judgment of the Postmaster-General and by your sanction upon evidence of inefficiency, misconduct, neglect of duty, shortage of accounts, insufficient bonds, and for other causes.

Fourth-class
removals.

The conditions of appointments at fourth-class offices, as stated in the commissions, are "to hold the said office of postmaster, with all the powers, privileges, and emoluments to the same belonging, during the pleasure of the Postmaster-General of the United States."

At fourth-class offices the removals during 1889 were.....	7,700
The removals during 1890 were.....	6,612

The total number of removals for the two years was..... 13,712

By comparing the two tables it is seen that the total number of removals of all grades of postmasters during the last eight months * of the term of your predecessor, and of the sixteen months of this administration, or during the period covered by my two annual reports, is 14,442.

Of course these figures do not give all changes that have taken place in Presidential and fourth-class offices in the last two years. The Department is continually making appointments under circumstances which have been caused by deaths, resignations, expirations of terms, and by the requirements of inspectors' reports. The full number of appointments during the past two years may be itemized and tabulated as follows:

All appoint-
ments during the
last two years.

In instances of death	1,226
First appointments at new offices.....	7,137
In places of others resigned	16,702
In places of those who had served out terms	779
At fourth-class offices which became Presidential*	435
At Presidential offices on inspectors' reports recommending removals.....	330
Total	36,680
Removals at Presidential offices for various causes, for the improvement of the service (a large part of the incumbents had served four years).....	390
At fourth-class offices, where there are no terms (some of these were removed on inspectors' reports).....	13,712
Total	14,072
Grand total.....	40,752

* The number was 555. Almost all the appointments had been made in previous years.

The full record of appointments for the past year, itemized and tabulated as above, is as follows:

In instances of death.....	673
First appointments at new offices	4,427
In places of others resigned	8,339
In places of those who had served out terms.....	580
At fourth-class offices which became Presidential*	134
At Presidential offices on inspectors' reports recommending removals	295
Total	14,448
Removals at Presidential offices for various causes, for the improvement of the service (of these all but eighty-eight had served four years and over).....	262
At fourth-class offices where there are no terms	6,012
Total	6,274
Grand total.....	20,722

The following table gives the number of appointments at all classes of offices for each particular cause, for each of the last two years and for the year ending June 30, 1886, the period in the administration of your predecessor corresponding to the past year of this administration:

Appointments.	June 30, 1889.	June 30, 1890.	In- crease.	De- crease.	June 30, 1886.
On resignation, Presidential	198	253	55		658
On expiration of term	190	580	390		
On offices becoming Presidential*	301	134		167	
On resignation, fourth class	8,165	8,080		79	8,454
	8,854	9,053	455	246	9,112
On removals, Presidential, inspect- or's report	55	295	240		
On removals, Presidential	98	202	104		243
On removals, fourth class, inspect- or's report	179	101		18	
On removals, fourth class	7,521	5,851		1,670	9,323
	7,853	6,560	404	1,688	9,566
On deaths, Presidential	45	31		14	20
On deaths, fourth class	508	642	134		567
	553	673	121	14	587
On establishment of post-offices.....	2,770	4,427	1,657		2,482
Total	20,030	20,722	2,640	1,948	22,747

* The phrase offices which became Presidential means that when the revenues of the offices increase to the amount fixed by law to constitute them offices of the first, second, and third class, then the appointments are transferred from the Postmaster-General to the President, who nominates candidates to the Senate for confirmation. In nine cases out of ten the President appoints the incumbent who has served while the office was fourth class.

Congressmen
elected by the
people speak for
them in the De-
partment.

In cases of appointments and removals the Department is obliged to depend (and is fortunate, as at present constituted, in being able to depend) upon the advice of Congressmen of both political parties. The appropriation for the inspector force is not large enough to permit anything more general than an examination of misdemeanors, cases of shortages, violations of the postal laws, frauds on the public, etc.; nor was it found possible during the past session to secure the authority of Congress to divide the country into postal districts, so that the offices might be examined by postal experts located in the regions with which they are most familiar, and so that, in the matter of appointments and removals as well as in the re-arrangement of routes and schedules and the general improvement of the service, the Congressmen might be relieved, in part at least, of the examination of cases which are often crowded upon them against their desire. The Department, being without this extra inspection force, is too busy to seek or to suggest where changes of postmasters may be made for the improvement of the service, and a large proportion of persons or communities are not interested to suggest changes. But the people generally expect, though they take no personal interest in the matter, that the postmaster will be changed with the change of administration. Hence the anticipated changes, though insignificant enough, are also numerous enough. Thousands of fourth-class offices do not earn \$50 a year apiece. In thousands of cases present incumbents are eager to be relieved of their offices, and it is only with the greatest difficulty that new candidates can be found to take them. In hundreds of cases persons of the opposite party are appointed or re-appointed by all administrations. In hundreds of cases changes are made simply to secure more convenient locations for post-offices. In hundreds of cases, again, it is considered politics, by members of the party which has lately been defeated, to discourage resignations until removals are made, so that the total of removals can appear in partisan journals as excessive.

As the condition of affairs now is, the Postmaster-General or the First Assistant only happens to stumble across the cases which require action. The Department neither asks for resignations nor authorizes any person or persons to ask for them; for, when it is clear that a change ought to be made, the President or the Postmaster-General has the power to make the required removal without indirection. I am able to recall perhaps ten cases, however, in the sixteen months of my incumbency where postmasters whose

habits have become such as to disgrace the service and whose friends interfered to prevent removals, have been notified in order that the publication of these disagreeable facts might be avoided, that they might resign if they preferred to do so.

It has been difficult in many cases where removals have been demanded to secure for the accused postmaster the treatment which should seem entirely fair to him. It is true that your instructions, issued to this Department in March, 1889, that no postmaster should be reported upon by an inspector who did not also have the chance to be heard in his own defense, were never to my knowledge disobeyed; and it is true that my additional precaution expressed in a letter* of explicit instructions, issued in January, 1890, by the chief post-office inspector to his various inspectors in charge, was never to my knowledge disobeyed; for I would not hesitate a moment to remove an inspector, any more than I would any other postal official or employé over whom I have jurisdiction, who disregards your instructions or mine, especially if, as might be the fact in this instance, he were to assume any attitude that might suggest the star chamber. It is hard to realize, however, how difficult it is, even for the experienced

Accused postmasters gets fair hearing.

*The following is a copy of the letter:

POST-OFFICE DEPARTMENT,
OFFICE OF THE CHIEF POST-OFFICE INSPECTOR,
Washington, D. C., January 24, 1890.

SIR: In nearly all cases, particularly those involving charges against postmasters, it is deemed by the Department that an opportunity should be afforded postmasters to make answer to charges which have been preferred against them. The Constitution of the United States guarantees to every citizen the right to be heard in his own behalf. This well-settled principle permeates all existing laws of this country, under which all persons are afforded opportunity to defend themselves against charges brought against them. Therefore, in cases where the character or conduct, official or private, of any postmaster is made the subject of an investigation, the inspector will, after properly investigating the same, acquaint the postmaster of the character of complaints or charges, without revealing the source of his information, and afford him an opportunity to be heard in his own behalf. In rendering this report upon the investigation, the inspector should state that the postmaster, or accused, has had an opportunity to be heard, recording therein the answer or defense of the accused. This letter of instruction is to give you in a general way the desire of the Department in the matter of treating postmasters where charges have been filed against them. I am aware that occasionally a case comes up where it would be inexpedient to acquaint the postmaster with the facts ascertained by an inspector. These cases, however, in my opinion, are very rare. You are not expected to pass on the political aspects of any of the cases or candidates, unless specifically requested to do so. You will instruct inspectors under your direction in accordance with the foregoing.

Letter to Inspectors.

Very respectfully,

E. G. RATHBONE,
Chief Inspector.

The INSPECTORS IN CHARGE.

inspector, to resist the temptation to find in the insulting disloyalty of ill-natured partisans sufficient cause for removal. I have myself been much criticised by fair-minded persons because removals for these offenses against decency have not been made, and I realize how hard it is for an inspector not to make mistakes. But it is a proud thing for the inspector force that in nearly every instance where the accuracy of the inspector's report has been called in question this sworn official of the Government has been vindicated by the subsequent investigation.

Inspectors' reports
are confidential.

It was once thought a delicate question, owing to the private nature of much of the information contained in inspectors' reports and other confidential papers, whether these reports and papers should be accessible to persons more or less interested in special cases. I do not agree with your predecessor that these papers should be denied to a committee of the Senate; for, as I am informed, a request of this nature from a committee of the Senate was once denied by him. The Senate has a constitutional right to inquire about appointments. An investigating committee of the House deserves, as I beg to submit, a similar courtesy. The same would be true of a court of law. Perhaps it might be said to be the right, rather than the privilege, of the court of law to have the papers. Beyond this category of Senators and Members, however, the confidential papers must not go. Rather must the Department, if necessary, suffer the odium of appearing to remove a person without cause. The confidential reasons which compel the Department to act must not be disclosed, first, because communities might in some instances be involved in strife and bitterness, and families might be subjected to disgrace and ruin. The removed person, either unaware of the full extent of the known information about himself, or else fully aware that no public use could in decency be made of it, often does not hesitate to talk or write about his so-called wrongs. If the truth were known, he would be the one most to suffer; and yet, no matter how one-sided or bitter his attacks may be, the Department can do nothing except wait for fair public scrutiny and hope for honest public treatment.

The postmaster in a small town is a candidate for re-appointment. The community in which he lives believes in civil-service reform, without quite knowing all that the words mean. Good citizens demand that the public service shall not be outraged by the appointment of any mere self-seeker or political "striker." The Department knows that

the candidate for re-appointment has not accounted promptly, possibly without fraudulent intent, for public money, or is a victim, say, of the opium habit. It will not re-appoint him. A cry is raised that the public service is prostituted to partisan ends. There are similar cases in large post-offices in which the postmaster similarly does his duty without fear. A letter-carrier in uniform goes into a brothel, becomes intoxicated, and disgraces his wife and daughters. He is removed. The same cry is raised that every right of citizenship is outraged.

The necessities of the secret service (which the Department can not do without), and the rights of good citizens who feel impelled to communicate disagreeable information, as well as all the dictates of charity, support me in this impregnable position. I apologize for this excursion into a question that is so well settled, but many of the honest, the thoughtful, and the friendly desire to be informed of these things. Your administration is to be congratulated that its long list of appointments will bear the closest examination.

CIVIL-SERVICE OF THE POST-OFFICE DEPARTMENT.

A year's experience confirms me in the judgment formed twelve months ago that the civil-service system, as applied to the rosters of the Post-Office Department, is susceptible of improvement. The examinations for the inspector force and for the Railway Mail Service ought to be made more difficult, so that the candidates for places will better stand the test of actual work. The practice of the Department shows that the inspector force, for example, is more efficient as a whole if eligibles who have seen public service are selected instead of those who have simply been examined. This means either that the examinations are not thorough enough or that examinations never can result in the selection of the proper proportion of efficient inspectors—a thing which I do not believe. It is estimated by the railway mail office that the proportion of railway mail eligibles who fail to fill the requirements of that exacting employment is a quarter or a third of all those examined. This means either that the examinations are not thorough enough or that it is impossible suitably to examine candidates for the Railway Mail Service—a thing which is certainly not true. The railway postal clerk can not be most efficient unless he has physical endurance. The inspector can not be most capable unless he is full of resources and alertness. Perhaps these observations seem trivial, but, if I

Examination
for Railway Mail
Service and in-
spectors should
be more difficult.

One-fourth or
one-third of all
examined fail to
give satisfaction.

may be permitted to make the statement, it is just in proportion as the examination system (which intends to be a merit system) provides candidates who succeed not only in holding their places, but in adding to the efficiency of the public service, that the reform can hope to gather momentum.

Certain plan of
promotion need-
ed.

I wish that some scheme might be devised by which the departmental force, and all parts and branches of the postal service, classified or to be classified, might be encouraged into new exertions by some just, general, and certain plan of promotions. This would perhaps involve the retirement at a certain age of Government employes who have been efficient in the past, and would possibly involve, too, the payment to them of a stated sum, or of smaller sums for stated periods. But scores of places in the Departments, and in the large post-offices, as I doubt not, are to-day filled with superannuated clerks who fail to do the work which the Department is required by Congress and the public to expect of them, and also prevent those from taking their places who would be glad to do all of the work well. It would seem as if we might either heartlessly remove these useless Government employes or else confess that we really have a civil pension roll. In any occupation it is the man who is looking for better work to do and for better pay for doing it that deserves the better work and the better pay; and I am certain that the efficiency of the whole postal force would be increased beyond all calculation if there could exist, in it and all through it, a continual upward movement, a regular and certain retirement in some just and humane way, and a consequent influx of the young, the strong, and the ambitious. Promotions in the service, like original appointments to it, ought always to be for the honesty, the capacity, and the loyalty of the service; and while it is often hard, though often necessary, to decide whether original appointments ought to be made for these purposes, it is never a question that the more frequently these deserved promotions occur the more these desired objects are obtained.

The cause of civil-service reform has been most in danger since the beginning of your administration, so far, at least, as the Post-Office Department is concerned, from its over zealous but short-sighted friends. It is dishonest to talk about violations of the civil-service law when the district attorneys are not appealed to to prosecute the supposed offenders. It is equally dishonest to pretend to be

friendly to the spirit of the reform, which, as I understand, is nothing more nor less than a steady effort, under the laws of reason and human nature, to improve the public service, and not suggest means by which the regulations, under which the instruments of the reform operate, may possibly be improved.

It is not truth and will not stand the test of time, to declare persistently, and in the face of the known facts, that forty thousand changes of postmasters, two-thirds of which are not to be avoided and all of which the present administration of the Post-Office Department does not shirk the responsibility for, are equivalent to forty thousand removals of postmasters; and this is true whatever the ideas of particular persons may be as to the necessity, or the value of political parties. Nor is it truth—and it will not stand the test of time—to reiterate over and over again, that the Railway Mail Service, which had been made the most effective body of civil servants in the United States under an old established merit system of its own, was basely prostituted to partisan ends, when this administration of the Post-Office Department was busying itself with putting back these trusty and tried men in the places of persons whose room was more valuable than their bungling assistance, and with waiting for the tardy certification of eligibles.

Many statements as to removals not true.

I think it would be impossible to find an appointing officer who has not been glad to take advantage of stringent examinations to keep away the mere political place-seekers. They used to be provided; they would surely be provided in all the Departments if they were lacking.

THE NUMBER OF POST-OFFICES.

The number of post-offices of each class at the close of the fiscal year 30th of June, 1890, with comparisons, was :

Class.	1890.	1889.	1872.
First	102	97	.....
Second.....	517	497	1,200
Third.....	2,119	2,090	.....
Fourth.....	59,663	56,315	30,663
Total	62,401	58,999	31,863

The number of new offices established in 1890 was..... 4,236

The number of new offices established in 1889 was 2,770

The net increase in the number of offices, after taking into account all the offices discontinued, was 3,905, a con- Large increase in number of offices.

siderably larger number than ever before in the history of the service, the next largest being immediately after the close of the war (1866), when the net increase was 3,378.

The number of offices enlarged to free-delivery offices in 1890 was.....	22
The number of offices enlarged to free-delivery offices in 1892 was.....	43
The number of substations and stamp agencies established in 1893, was.....	394
The number of substations and stamp agencies established in 1894 was.....	94

FREE DELIVERY EXPERIMENTS.

Village free delivery.

Congress, by joint resolution late in the session, gave authority to the Postmaster-General to use \$10,000 of the annual appropriation for the free delivery for the purpose of ascertaining in a practical way the feasibility and cost of extending the free delivery to small towns and rural districts. Applications are now being received from various communities for the benefits of the free delivery. The experiment will be made in as many places as the appropriation will warrant. In villages one plan is to allow to the postmaster sufficient money to pay for the service of a man or boy for one or two hours per day, as the case may require. Those who prefer to go in person to the post-office will do so as hitherto, but those who can not get a daily paper because they can not go to the post-office every day for it, can have it delivered at their doors if they live, say, within a radius of two miles. In thinly settled rural districts it has been proposed to ask the school teachers to distribute the mails to pupils authorized by parents and neighbors to receive them. No doubt a dozen different devices can be tried.

TO SAVE THE TIME OF CARRIERS.

Home letter boxes.

It is estimated that a quarter of the time of a letter-carrier is spent waiting for answers to door bells. With a view of providing means to save time and hasten deliveries inquiry has been made for a small, safe, and inexpensive letter-box to be recommended for general adoption. A commission of five of the leading postmasters of the United States was appointed and an advertisement issued calling upon inventors to submit models and devices with estimates of the cost of the same. Five hundred and sixty-four models and designs were submitted. Sixty-five gentlemen appeared before the commission at its meeting in Octo-

ber to explain models and make suggestions. The report of the commission appears in full in the appendix.

It does not appear that among all the boxes presented and examined there was one of sufficient merit to justify its recommendation for general use; but three models were selected and the proposition made to combine in one projected box the advantages of each, if it should be possible to bring about such a result; and if it should be possible to find some way not only to deliver the mail quickly, but to collect it at each house, it would prove to be a great convenience and work a great change in the postal system. If letters can be mailed without going outside of one's house, the revenue would be largely increased and the safety of the mail greatly enhanced.

Combination of
three models
suggested.

POSTAL DISTRICTS AND SUPERVISORS.

The recommendations in my last annual report to help the Department to come into closer relations with the post-offices met with the approval of the Committee on the Post-Office and Post-Roads of the House, who reported favorably a bill to establish twenty-six postal districts. The Committee of the Senate on the Post-Office and Post-Roads concluded to recommend in preference an enlargement of the inspecting force, and the Senate appropriated \$50,000 for this purpose. The House did not concur in this increased appropriation, and nothing has therefore been accomplished.

It seems unfortunate that 50,000 of the 62,400 post-offices are without any supervision beyond the formal reports of the postmasters. Important offices have not seen an inspector for five years. The Inspecting Division is always several months behind its work for lack of men to cover the field. The particular work of the inspector is the investigation of accounts, frauds, and violations of statutes. In later years schemes to defraud by the use of the mails have greatly multiplied, and the Department has been hard pressed in its efforts to protect the public.

Better super-
vision needed
over post-offices.

The special work of improving and grading the offices, training new men, explaining postal laws, and reorganizing systems of business at offices has from sheer necessity been wholly left undone. If it is thought best to provide for this important work as a branch of the Inspecting Division I will use my best endeavors to make it successful, but I believe the appropriation of even \$70,000 to be used in the discretion of the Postmaster-General in the general supervision of all the offices would enable him to select from

the center of a given district the most successful postmaster, whose assistance to the offices immediately surrounding would be returned five times over in great improvements to the service and consequent increases of the revenue. By using the postmasters as supervisors an increase of Federal appointments is required. One year's trial of such a system of supervision would, in my judgment, actually reduce the number of persons employed in some branches of the service.

Fourth Assistant Postmaster-General recommended.

I beg to draw attention to my letter to the Committee on this subject in the appendix; and in connection with this I renew my urgent recommendation for another Assistant Postmaster-General to take up several branches of the service needing closer attention than the present organization permits.

EXPERTS AND IMPROVED BOOK-KEEPING.

Better accounting needed.

The accounting system of the Post-Office Department needs revision. It is not uniform for the large offices, and it is not improbable that it might be much improved for the smaller ones. No well-conducted business establishment would allow its agent at New York to keep his accounts according to one plan and his agent at Chicago, transacting precisely the same business, to keep them on another plan. It is just this state of affairs which has made much confusion in the postal system, so that it has happened that when it became necessary for an inspector, or for a body of inspectors or a commission, to visit and examine the financial affairs of any of the larger offices, its system of accounts had first to be learned, necessitating a considerable loss of time; and if the same officers, as frequently has happened, were then to proceed to some other large post-office for the same purpose, a like task was set before them. The same is true of most of the great city post-offices.

Commission on accountant work.

I therefore had the honor during the last session of Congress to request authority to expend from the appropriation for post-office inspectors \$5,000, or so much of that amount as might be necessary, in the employment of expert accountants to prepare and submit a plan for a uniform and more complete system of keeping accounts in the Department and at post-offices of the first, second, and third classes, so as to insure greater accuracy and to lead to more speedy settlements. This authority was granted in the annual appropriation bill, and I appointed a commission, consisting of Henry S. Adams, cashier of the post-office at Boston, James Warrington, consulting and expert account-

ant of Philadelphia, and James Yalden, consulting and expert accountant of New York, with Mr. Adams as chairman, to undertake the task outlined. The members of this commission were instructed to familiarize themselves with the departmental system at Washington and in the office of the Sixth Auditor, and then to visit a reasonable number of post-offices in each of the three higher classes, so that they might be acquainted practically with the conduct of the financial affairs of such offices.

For the sake of economizing as much as possible the fund at the disposal of the Department, it was stipulated that unless otherwise ordered the duties of the commissioners should not extend beyond two months; and postmasters and all officials of the postal service were required to extend to them every assistance. I have great confidence in the ability of the members of this commission to evolve something which will be of lasting benefit to the fiscal system of the postal administration. I believe that the practical experience in postal affairs of Mr. Adams, joined with the professional and general business training of the other two gentlemen will bring to the service a simpler, safer, and more complete mode of accounts, free from unnecessary complications.

A POSTAL MUSEUM.

Steps were taken in March of the current year to establish in Washington a museum that should represent the progress of our postal system from its inception, and should illustrate the work of the United States postal service, as well as that of foreign countries. A general notice was given to all postmasters and postal employes to make search through their offices and to send to the Department whatever they might find that would be desirable for exhibit in such a museum. They were also requested to endeavor to interest their patrons in the subject and transmit to the Department all articles which might be donated for the purpose in view. At the same time a letter was sent to each of the leading postal administrations in the world, inviting attention to the work undertaken, bespeaking their interest, and suggesting contributions such as would convey to visitors some idea of the postal work of foreign nations. The responses have been very liberal. There is at present scarcely room or force adequate to arrange and classify properly for exhibition the contributions received, but the room will be supplied before long upon the completion of a new building rented by the Department for the Sixth Auditor. This will vacate some of the rooms in the

Liberal contributions.

main building. I have felt more than warranted in asking from Congress an appropriation of \$1,000 for miscellaneous expenditures on account of this museum, and of \$1,200 for a competent man to put in charge of it. The material on hand, together with that already accumulated in the museum of the Dead-Letter Office, will amply repay the expenditure in point of interest and utility.

POSTAL GUIDE AND LIBRARY.

Guide should
not contain ad-
vertisements.

The Department ought not to obtain its official publication at small cost by permitting publishers to recoup themselves by inserting advertisements, some of which are excluded by leading magazines and newspapers; and for this reason I have asked for an appropriation of \$29,000, instead of \$18,200, in order to obtain a creditable and dignified Postal Guide, free from all matter except such as will be useful to the public and to those who do the practical work of the postal service.

Library should
be improved.

The Department library has been one more in name than in reality. It has been little more than a repository for accumulations of public documents and reports. I have asked in the annual estimates for an appropriation of \$1,000 for the purchase of books, and of \$1,000 for the pay of a librarian. The information and benefits to be derived by the army of postal employes, from a collection of standard books of reference on postal subjects, will fully justify this expenditure.

PNEUMATIC TUBES.

Between 50 and 60 miles of pneumatic tubes are buried in the streets of Berlin, connecting the substations with the main post-office. Similar use of pneumatic tubes is made to a lesser degree in Paris and in London. The rapidity with which a letter goes from one side to the other of a city as large as Berlin is a wonder even to an American. Two gentlemen, at different times, one of them an expert, at the request of the Department, visited the large postal centers of the world to study the pneumatic system. Their reports are not yet ready for publication; but it is hoped that the way may be clear to connect the Executive Departments and the Senate and House of Representatives with the Washington city post-office as the first experiment in this direction, and that the system may then be extended to the substations and post-offices of large cities. I should especially like to see a pneumatic system working perfectly in

Chicago by the time the World's Fair is in progress, so that the postal exhibit there would really show this high development of the service.

THE PAY OF THE RAILROADS.

The rate of compensation to railroads for mail transportation was established in 1873. In July, 1876, it was reduced 10 per cent., and in June, 1878, it was further reduced 5 per cent. In the matter of extra compensation for the use of R. P. O. cars, no reduction has taken place since March, 1873, though concessions have been made by the companies in the matter of space. In the past twelve years no reduction of rates has taken place, though the freight rates upon all railroads have been steadily lowered. During this period the weight of the mails has largely increased. It is quite reasonable to say that the reduction in freight rates generally between 1878 and 1890 is not less than 20 per cent., and in many instances it is much more. The largest expenditure of the Department is for transportation. The estimates just sent to the Treasury for the next fiscal year cover \$22,610,128.31 for railroad transportation alone. A reference of this subject to the Committees on the Post-Office and Post-Roads of the Senate and the House of Representatives for some form of inquiry and report is respectfully suggested.

Inquiry should be made as to rates.

NEEDED PUBLIC BUILDINGS.

Soon after Congress convened the Committee on Public Buildings took up the question of a new building for the city of Washington and finally passed a bill to erect a building at Pennsylvania avenue and Ninth street. The structure proposed was so palpably inadequate that I felt impelled to appear before the Senate committee and argue the case (as per statement in Appendix E), and succeeded in convincing that committee that it was best to abandon the plan contemplated in the House bill.

On the 25th of June, 1890, Congress authorized the acquisition of square 323, bounded by Pennsylvania avenue, C street, and Eleventh and Twelfth streets. The act appropriated sufficient money for the purchase of the ground without naming any sum. It also limited the cost of the city post-office building to \$800,000 without making any appropriation. On the 30th of August, 1890, in the sundry civil bill the limit of the cost of the building was increased to \$1,900,000, and \$250,000 was appropriated to begin the work, it being stipulated that the structure should be

Eight-story building unsuitable.

eight stories high. I do not hesitate to say that an eight-story building for post-office purposes will be the ruin of the health of the hundreds of men who must labor in the darkness and bad air of a ground floor with seven stories piled above their heads, and that the cost of such a building is a great waste of the public funds. If the new edifice is to be an omnibus building, to be used by the various departments as tenants, the whole structure should be built for that purpose. The post-office building of the city of New York is a fair example of the folly of such a structure. There the postal clerks, though there are streets on all sides, exist as if confined in a dark, unhealthy prison.

Ground floor
for Post Office
work.

The work of a post-office to be convenient to the people must be done on the ground floor. If located in a large city where the mail is large and the clerks are many, it should not be over one high story, with portions perhaps of two stories for certain offices of accounts and for the sake of architectural appearance. Abundant light from the roof and good air will quicken every movement of the mails and the saving in top stories, elevators, boilers, etc., will doubtly compensate for the increased cost of the ground area.

It is not too late to amend this bad plan and adapt the new Washington structure to the use of the increasingly overerowed Post-Office Department, massing under one roof the Sixth Auditor of the Treasury, the money-order office, the mail-bag works, the supply division, and the topographical office, all now occupying separate buildings, the rent of which, with the additional outlays for wagon service, elevators, porters, and watchmen would pay a good interest on the entire cost of the proposed new building. Settle the city post-office in a low, light, large, separate inexpensive building, as a wing of the Post-Office Department, and by contiguity get the benefit of the supervision of the Department officials, who could develop at least one nearly perfect post-office as an example for all others. The building of an eight-story block at an expense of not less than \$2,500,000 for city post-office purposes is altogether unnecessary. Counting the rental at 10 per cent., the rate common in Washington for large buildings, the enormous sum of \$250,000 per annum would be a fair rental. The rate paid for the building now in use by the city post-office is \$8,000. Proper permanent accommodations for the post-office alone could be provided for the sum of \$250,000, a single year's rental as above stated. Ample and well located quarters can be rented for the city post-office at \$15,000 per annum in a new building about to be erected. Our present lease expires on the first of

July next, and the probability of the elapse of four or five years before a new stone building could be completed, will make it necessary to move at least temporarily to some new place.

I recommend the modification of the present project in these respects. Let the Post-Office Department take the structure proposed at the corner of Pennsylvania avenue and Eleventh street, locate the city post-office on adjoining property as a part of the postal enlargement, and use the present Post-Office Department building for the Interior and other Departments now using rented buildings. Or, as an alternative, change the plan to a much less expensive structure especially adapted to post-office purposes. I urge that the Secretary of the Treasury and the Postmaster-General be a commission to secure the ground and erect a twin building for the use of the Department and the city post-office at a cost not to exceed the sum already appropriated, exclusive of the cost of the ground.

Change of
plans recom-
mended.

NEW BUILDINGS TEN FOR ONE.

Looking backward five years at the style and cost of the new buildings throughout the country completed or going up for post-offices, I am satisfied that nine more creditable and all-sufficient buildings could in many instances have been erected at other points equally entitled to them for the cost of one of the granite and iron structures that in many respects are out of all correspondence with the town and the affairs to be transacted. To move out of a \$600 rented room, safe and ample for the postal business, into a \$100,000 building, where the janitor alone gets more salary than the whole of the rent in the former place, can not be justified on any business principles. The postal service does not need any such expenditures. A one-story structure is all that is required in three cases out of four. Of course due regard must be paid to the size of the town and the location in which the building is to be erected, as well as to architectural features conformable to the dignity of the Government; but to waste money on numerous stories, with towers and turrets for dignity alone, is not in accord with the American idea of utility and taste.

Greater econ-
omy in build-
ings.

I have favored and urged the bills now pending in Congress to regulate appropriations for post-office buildings according to the gross receipts of the offices, somewhat as follows: Taking the gross revenues for two successive years, with \$25,000 receipts, a \$25,000 building; with \$20,000

receipts, a \$20,000 building; with receipts of over \$5,000 and up to \$15,000, a \$10,000 building. If Congress were to provide \$1,000,000 to be spent under the direction of the Supervising Architect and the Postmaster-General, between seventy and eighty proper buildings could be erected; whereas under the present system the Government will only get from ten to fifteen. I recommend most earnestly the passage of the bill No. 176, House of Representatives, presented by Mr. Blount of Georgia.

A NEW POST-OFFICE BUILDING FOR NEW YORK CITY.

New York
building inadequate.

The relation of the New York post-office to the postal system is not unlike that of the clearing-house to the New York banks. Its operations affect in some degree almost every other office. Lack of space or working force is felt throughout the service. The applications of the postmaster at New York for clerks and carriers were necessarily very large during the last year, but they have been granted, after careful investigation, in almost every instance. Over \$200,000 has been added to the pay-roll of the clerical force in twenty months, which is a much larger amount than was ever granted before in a corresponding period. But however much the Department tries, it can not overcome fixed physical conditions. It is useless to expedite trains and lose the gains at an overcrowded post-office. The fleet ocean steamers might as well be a day late, so far as the mails are concerned, if their immense bulk of incoming matter is to be piled up in the New York office until space can be cleared for it. The post-office building is totally inadequate. The men can not be managed either economically or with the greatest speed. Of this I became convinced by personal examination over a year ago, and publicly and privately have advocated better quarters.

New York is the metropolis. It is also the great center for the dispatch and distribution of outgoing and incoming foreign mails. Any delay or stoppage here is almost a national inconvenience. The necessity for more room for the every-day work of the postal service, without reference to the rush and hurry of extra-busy seasons or extra emergencies when foreign steamers arrive together, is clearly apparent. The newspapers understand this very well. So do the business men and the citizens who stop to think about it. There is no question but that the Government ought to provide a proper building. A new location does not by any means necessitate a withdrawal of first-class postal

conveniences from the present neighborhood. In fact, it must not. A large substation near the great newspaper offices will always be a necessity; and it must be perfectly equipped and commodious.

The Treasury Department and the citizens, as is well known, settle all questions of location. The Post-Office Department has no other relation to a public building than that of tenant. Therefore, I do not desire to offer any opinion except to say that the money appropriated should be largely spent for ground, and not for an eight or ten story building. If the cost of the unnecessary upper stories could be put into additional ground to be covered by a structure of one high story and gallery, with three stories along the front for offices, it would be the ideal building. There is also this to be said: if the new structure were close to a railroad station, so that mail cars could be run upon covered sidings, much time and expense would be saved; it is a clear loss of money and time to haul mails from one end of a city to the other, or from one side to another, only to carry them back again over the same territory. Time is always economized if stations are located near the railroads. The post-office and the stations should be connected either by pneumatic tubes or by means of electric underground cars. A special corps of carriers should make half-hourly deliveries in the mercantile parts of cities as large as New York, Chicago, or Boston.

Might be close
to railroad sta-
tion.

The gross receipts of the New York office for the year ended June 30, 1890, were over \$6,000,000; the total expenditure during the same period was two millions and a half; and while it is true that this income and this expenditure were not entirely due to local causes it is nevertheless certain that the New York office would earn enough money during the time while the new building would be in process of construction easily to pay for the structure. The congestion already set in at the metropolis will each year cripple more and more the postal service of the United States. That fact is clearly to be foreseen by the following table, which shows the increase of business at the New York office for five years past and the estimated increase for five years to come:

Period.	Gross revenue.		Matter handled by post-offices (collections and deliveries).		Expenditures for clerks.		Carriage.	
	Amount.	Increase.	Number of pieces.	Increase.	Amount.	Increased.	Number.	Increased.
<p> <i>Increase of business at New York.</i> PAST FIVE YEARS. Year ending June 30— </p>		<i>Per ct.</i>		<i>Per ct.</i>		<i>Per ct.</i>		<i>Per ct.</i>
1885.....	\$4,340,122.20		324,656,729		\$693,652.65		829	
1886.....	4,416,847.59	1.8	330,678,429	1.8	801,922.03	1.2	762	12.2
1887.....	4,753,515.20	7.6	335,325,291	5.5	951,564.49	18.0	718	6.1
1888.....	4,921,366.02	3.5	355,072,049	6.00	995,062.53	4.6	768	2.0
1889.....	5,420,170.89	10.2	399,601,675	12.3	1,025,268.08	6.2	1,200	41.3
1890.....	5,026,927.16	11.9	448,651,786	12.3	1,119,726.43	8.6	1,293	7.2
<p> COMING FIVE YEARS.* Year ending June 30— </p>								
1891.....	6,430,758.85	6.8	470,160,107	6.8	1,180,012.60	6.0	1,247	12.3
1892.....	6,874,458.45	6.8	511,742,804	6.8	1,250,814.47	6.0	1,400	12.4
1893.....	7,342,121.02	6.8	546,541,617	6.8	1,325,803.24	6.0	1,578	12.4
1894.....	7,841,835.86	6.8	583,796,340	6.8	1,405,415.14	6.0	1,772	12.3
1895.....	8,374,000.12	6.8	623,398,371	6.8	1,489,749.02	6.0	1,907	12.3

*NOTE.—The rate of increase estimated for the five years from 1891 to 1895 is the average rate of increase on each branch of the statistics for the previous five years.

THE COUNT AND WEIGHT OF MAIL.

For important statistical purposes the Department has been at a loss for reliable data as to the number of pieces and weight of matter passing through the mails and the amount of revenue derived from each of the several classes of matter. For reasons involving the quickest possible dispatch of the mails it is impracticable to take a continuous account of matter mailed. But a count of mail-matter was ordered at all post-offices in the country for the seven consecutive days beginning at 6 o'clock a. m. on the 5th of May, and ending at 6 o'clock a. m. on the 12th of May. The blank forms provided called for separate information on 33 distinctive items. The instructions enjoined the utmost care upon the postmasters in making accurate reports. The week selected was believed to be a fairly average period upon which to estimate the total business for the year. The returns were carefully compiled by a special clerical force detailed from the various bureaus of the Department. The results of the work, which was one of no small magnitude, will be found in the following tabular statement.

Complete data collected.

Statement of matter sent through the mails during the fiscal year ending June 30, 1890, as estimated upon the basis of an actual count at all the post-offices, for the seven days beginning at 6 o'clock a. m., on Monday, May 5, and ending at 6 o'clock a. m., on Monday, May 12, 1890.

	No. of pieces.	Weight.	Amount of postage.	Average weight per piece.	Average amount of postage per piece.	
DOMESTIC FIRST-CLASS MATTER.						
1. Letters mailed to other post-offices (postage 2 cents an ounce or fraction thereof)	1,561,452,742	<i>Pounds.</i> 37,872,584	\$32,516,025.53	<i>Ozs.</i> .38	<i>Cts.</i> 2	Items of mail matter.
2. Drop-letters for local delivery (postage 2 cents an ounce or fraction thereof)	258,681,155	5,482,946	5,338,650.42	.38	2	
3. Wrapped parcels, sealed, mailed to other post-offices (postage 2 cents an ounce or fraction there- of)	4,078,096	582,371	100,076.17	1.8	3.0	
4. Wrapped parcels, sealed, for local delivery (postage 2 cents an ounce or fraction thereof)	258,939	45,730	10,814.43	2.8	0.6	
5. Drop-letters at 1 cent an ounce....	34,523,905	820,335	847,385.51	.38	1	
6. Wrapped parcels for local deliv- ery at 1 cent an ounce.....	534,828	61,079	12,630.38	1.8	2.3	
7. Postal cards mailed to other post- offices.....	322,136,513	1,711,350	3,223,102.03	.085	1	
8. Postal cards deposited for local delivery.....	107,978,837	570,450	1,073,788.37	.085	1	
Total first-class matter	2,280,950,015	47,147,445	42,724,852.44	.33	1.9	
SECOND-CLASS MATTER (PREPAID).						
1. Mailed by publishers and news agents (postage 1 cent a pound). ..	711,915,450	174,046,764	1,740,467.64	3.0	.24	
2. Newspapers, other than weeklies, and periodicals not exceeding two ounces in weight (postage, 1 cent for each copy)	7,973,123	975,200	92,638.29	1.0	1.1	
3. Periodicals weighing over two ounces (postage 2 cents each)....	1,573,332	304,436	38,899.76	3	2.5	
Total second-class matter.....	721,461,905	175,326,490	1,873,005.69	3.88	.25	
Transient newspapers and periodi- cals prepaid with postage stamps affixed (postage, 1 cent for each four ounces or fraction thereof) ..	56,966,610	11,717,160	880,507.30	3.88	1.5	
THIRD-CLASS MATTER.						
1. Mailed to other post-offices.	416,187,090	40,288,611	5,792,418.05	1.6	1.4	
2. Deposited for local delivery	60,787,576	3,223,270	669,434.48	.84	1.1	
Total third-class matter	476,974,675	43,611,881	6,461,852.53	1.46	1.35	

REPORT OF THE POSTMASTER-GENERAL.

Statement of matter sent through the mails during the fiscal year ending June 30, 1890, etc.—Continued.

		No. of pieces.	Weight.	Amount of postage.	Average weight per piece.	Average amount of postage per piece.
SEEDS, SCIONS, BULBS, ROOTS, ETC.			Pounds.		Oz.	Cts.
	1. Mailed to other post-offices	4,695,531	7,410,836	\$222,918.89	8.3	4.76
	2. Deposited for local delivery	117,289	17,964	\$,641.61	7.45	2.94
	Total seeds, scions, bulbs, roots, etc.	4,812,820	7,428,800	\$223,560.50	8.19	4.7
FOURTH-CLASS MATTER.						
Items of mail	1. Mailed to other post-offices	35,472,934	11,027,130	\$,868,913.82	4.9	5.7
matter.	2. Deposited for local delivery	2,016,706	461,709	\$6,432.64	3.7	4.63
	Total fourth-class matter	37,489,640	11,488,840	\$,875,346.46	4.9	5.73
MATTER TO FOREIGN COUNTRIES.						
	1. Letters and sealed parcels	27,162,215	790,657	\$,484,234.48	8.47	5.40
	2. All other matter to foreign coun- tries	14,111,027	8,151,113	\$24,898.76	8.6	3.3
	Total foreign matter	41,273,242	8,950,771	\$,509,133.24	7.53	4.4
	Total paid matter	36,288,893	10,439,611	\$,384,480.70	7.9	4.34
FREE MATTER.						
	1. Second-class matter mailed free in country of publication	307,141,350	80,714,135		1.6	.....
	2. Letters inclosed in free-penalty en- velopes	50,188,154	7,160,228		2.23	.....
	3. Supplies, blanks, twine, etc., and all other matter mailed under free-penalty labels or penalty envelopes used as labels	7,587,821	27,543,010		36.08	.....
	4. Franked matter, books, pamphlets, reports, seeds, etc., mailed free, under frank or otherwise, as provided by sections 409 to 414 of the Postal Laws and Regula- tions of 1867	11,591,840	4,279,640		5.9	.....
	Total free matter	376,509,165	92,696,923		2.96	.....
	Total paid and free matter	4,005,402,200	105,136,534	\$,888,821.40	7.48	4.39
Total amount of prepaid postages as shown in above table				\$888,821.40		
Amount of due postages collected				\$280,039.01		
Amount of special-delivery stamps mailed				176,092.80		
Amount of registry fees on paid matter				1,216,476.90		
Letter postage paid in money				108,723.41		
Box rents				2,257,308.70		
Fines and penalties				6,812.26		
Dead letters				12,319.73		
Miscellaneous				20,801.00		
Money order revenue				804,226.24		
Total revenue				\$4,005,402,200.00		

SHALL LETTER POSTAGE BE REDUCED TO ONE CENT?

There can scarcely be a difference of opinion as to the very general interest in the subject of one-cent letter postage. Conventions and associations have declared for it, newspapers advocate it, and great numbers of the people believe in it and want it. With my short acquaintance with the postal business a year ago I did not feel competent to pass a judgment on the question beyond recording my conviction that the state of the postal revenues at that time would hardly justify the reduction. To some, who do not look far beneath the surface, the question may seem quite easy; but short inquiry will show that there are many obstacles difficult to overcome. I will try to give the result of my investigations.

If the postal revenue arising from letter postage could be set aside for its proper uses the millions of letter writers of this country might quickly be permitted to enjoy a reduced taxation on letter writing. In point of fact there is a clear gain of nearly \$30,000,000 from letter postages. This large profit, with the annual deficit (which last year amounted to \$5,768,300) appropriated out of the General Treasury, is all swallowed up by the losses on other classes of mail matter carried at less than the cost of distribution and handling. Part of this loss is caused by the transportation of periodical and newspaper mail handled at one cent a pound, of newspapers carried free within the county of publication, and of other matter franked or carried free under penalty envelopes.

Profit on 2-cent
letter postage.

The question is often asked, Why there should be any deficit with a profit on letter postages and a constant increase in business from the natural growth of the service? The answer is very plain. The Postmaster-General is obliged to proceed under enactments of Congress which in four important particulars put large expenditures beyond his control. These are the rates of transportation; the pay of postmasters which are regulated by the receipts at post-offices; advancing salaries under classification bills, and the extension of the free delivery, which is proportionate to the increasing population of cities. These regulations, which have been formulated into laws by those who represent the people, are of course what the people want. If it were possible to stop all expenditures where they stand to-day the natural growth of the business would soon overcome any deficiency. But this is not possible; increasing work necessitates increasing pay in salaries. The emigra-

Large expenditures fixed by
law and can not
be controlled by
Department.

tion into new States compels an extension of railroad and star routes. Without postal facilities the settlement of new States would be greatly retarded. People will not move into new countries where they can not have the newspapers and the letters of their kindred and friends. It is, however, quite within the power of Congress to determine whether one-cent letter postage is preferable to the usual annual extension of the service.

Total revenue
on letter post-
age.

That the subject may be properly understood, I have had prepared with as much care as possible a few tables of estimates to show the possible condition of the postal service when looked at from various stand-points. In the first place, there need be no conjecture as to the principal item of cost in trying to drop to a one-cent rate. The amount received from letter postage last year was something over \$38,000,000. This sum would be cut exactly in half, and we would, therefore, get but a little over \$19,000,000. The deficiency for the current year is likely to be \$4,530,000, which would make the total deficiency \$23,500,000, and more. This large deficiency under a one-cent rate would be reduced, first, by the natural increase of business; second, by the stimulus of a low rate of postage; and, third, by the completion of the pending legislation to collect proper postages from sample copies of so-called newspapers and from paper-covered books. It is estimated that by the sample-copy abuse over \$1,000,000 is annually lost to the revenue, and in the transportation of paper-covered books considerably more than \$1,000,000 is kept out of the postal income, or postal trust fund, for the benefit of certain book publishers. The deficiency under a one-cent rate might be still further reduced by the adoption of improved devices, from time to time, which would save time and money.

Free work for
Executive De-
partments.

The most formidable item for consideration is the eight million dollars' worth of postal work performed annually without pay for the Executive Departments. If each of the Departments had paid its postage, the revenues of this Department would have been \$8,000,000 more annually than it is now. It is true that the census year caused an extra amount of work, but the natural and regular increase is enormous. I hold that the General Post-Office should be paid by the Executive Departments for labor performed and be paid at the same rates as the public pay. It will at once be said that it makes no difference whether the work is settled for by the various Departments or by one Department alone; but so long as a deficiency in the Post-Office Department stands in the way of proper appropriations for the

needed extension of the service or the reduction of rates, it is but fair to direct attention to the reason why these things are so. The letter-writers, who contribute the largest portion of the postal tax paid into the Treasury, may justly claim that this money shall be given back to them in lower rates or new facilities. At present a part of the letter postage is applied to forwarding military supplies to the Army, trees and shrubs to agricultural stations, and huge boxes of census blanks to the farthest end of the country.

It will be immediately remarked by those who know the facts that a large part of the loss of the Department arises from carrying newspapers in the mails at 1 cent a pound; but it is the foundation purpose of the Post-Office Department to transmit intelligence, and therefore legitimate newspapers are entitled to practically a free use of the mail. There are strong practical as well as theoretical arguments for this, as the readers of newspapers are much more numerous than the writers of letters and would feel an increased newspaper rate much more. But this argument does not apply to paper-covered books, which by various devices represent themselves to be magazines and are now allowed in the mails at a loss of \$1,000,000 annually; and there is no necessity for this, as the newsdealer or the book publisher, and not the reader, would pay the infinitesimal difference in the cost of each book carried by the express instead of the mail transportation. I do not think it would make a difference of a quarter of a cent on each book, or that readers would ever know the difference if the paper-covered literature alluded to were made third-class matter.

Loss of one
million dollars on
paper-covered
books.

It does not seem fair to letter-writers to take the profit made upon the transportation of letters and give it away for the support of the War, the Agricultural, or the Interior Department, or to let it go to book and newspaper publishers of a certain class. The Post-Office Department would be self-sustaining if it had credit for the work it does for nothing, and practically nothing, and if these different classes of mail matter were all put upon a self-supporting basis.

In the various tables that follow I show the probable financial condition of the Department under two-cent letter rate, with and without certain credits for work now done free for the Executive Departments, and also under changes and economies possible to be made or practiced. I think it proper to give other tables showing what the probable movement of the revenue would be under a one-cent rate, and what may be expected under changes and economies.

There is much more to be considered than the simple reduction of the revenue from \$38,000,000 to \$19,000,000. There must be additions to the expense account for additional clerks, carriers, railway transportation, and railway postal cars. It is impossible to determine with any accuracy how much this additional cost will be, but consultation with practical postal authorities leads me to believe that the sum stated in the tables is a fair approximation.

Deficit could be removed by legislation.

It is very clear that if a Postmaster-General could apply the ordinary rules of business to the affairs of the postal system he could make changes that would add vastly to the annual revenue. I said this a year ago, and my experience during the last year confirms this opinion. It is perhaps wise to go slowly with new legislation, but a growing service nevertheless requires new adjustments. The lack of legislation, in many instances, means large losses. The members of Congress know this, but the course of legislation moves in certain channels. For example, a system of close supervision and compact organization of the smaller post-offices, so as to make them tributary to the larger offices, would be the means not only of improving the service, but of adding largely to its revenue. But this all requires new legislation. One-cent postage will probably be delayed as long as any deficit appears in the books of the Department. Yet this deficit might quickly be removed by the passage of a few measures of legislation. It is only a question of time, therefore, when one-cent rate will be successfully demanded. The money paid for postages by letter-writers is, according to my view, a trust fund, and it is not proper to use it for any other purpose than in paying the cost of the work performed, in extending the convenience of the service, and in reducing rates.

Increased business results from lower rates.

Past experience shows that a large increase of business has resulted from the stimulus of a lower rate of postage. The three radical reductions in the rates of letter postage since the foundation of the Government occurred in 1845, when the letter rate was established at 5 cents; in 1851, when it was reduced to 3 cents, and in 1883, when the rate was fixed at 2 cents. For a number of years prior to 1845, under the exorbitant and complicated rates then prevailing, the revenues were almost stationary in amount, being about \$4,300,000 annually. For the first year following the reduction of 1845 the revenue was about \$3,500,000, showing a falling off of about \$800,000. For the year ending June 30, 1851, six years after the reduction, the revenue had grown to about \$6,400,000, being nearly 50 per cent. more than the revenue prior to the reduction in 1845.

For the first year under the reduction of 1851 the revenue was about \$5,200,000, or about \$1,200,000 less than the previous year under the old rate. Eight years later, in 1860, the revenue had increased to about \$8,500,000, or nearly 65 per cent. more than that of the revenue for the first year under the three-cent rate. For the year ending June 30, 1883, the revenue was about \$45,000,000. For 1884, the first year under the two-cent rate, the revenue was about \$43,340,000, showing a falling off of about \$1,660,000. The revenue for the year ending June 30, 1890, was upwards of \$60,000,000, and this amount is about \$15,000,000, or, say, one-third more than the revenue of 1883, the last year under the old rate.

This result was accomplished in the face of the following important reductions in the rates of postage occurring during the intervening seven years: First, the reduction in 1884 on transient newspapers and periodicals from 1 cent for 2 ounces to 1 cent for 4 ounces; second, the increase in 1885 in the unit of weight of first-class matter from one-half ounce to a full ounce, the rate of postage remaining the same; third, the reduction in 1885 of the rate on second-class matter from 2 cents to 1 cent per pound; and, fourth, the reduction in 1888 of the rate of postage on seeds, scions, bulbs, and plants from 1 cent per ounce to 1 cent for two ounces. The reduction of the letter rate in 1845 was made in face of a small deficiency in the revenue, but the reductions of 1851 and 1883 were preceded by a small surplus of revenue over expenditures. The deficiency of the revenue for the first year under the reduction of 1845 was about 14.4 per cent.; for the first year after the reduction of 1851 it was 27 per cent., and for the year after the reduction in 1883 it was 6.6 per cent.

The following tables are printed because they show more clearly and forcibly the information I desire to set out than the same information could be conveyed by paragraphs of words. I would like it plainly understood that these tables are not intended as a demonstration that one-cent postage is practicable at this or any other particular time, nor as a demonstration that certain conditions upon which the calculations are based and depending upon pending and new legislation will be fulfilled. They are simply intended to explain what the state of the Department's finances would be under the conditions shown in each table. They are estimates as accurate as the information at the command of the Department would warrant.

Table No. 1, the starting point, compares the revenues

Certain conditions assumed and results shown.

and expenditures of the service for each of the six years from 1890 to 1895.

The estimated increase of the revenue for 1892 over 1891 is elsewhere shown to be 10 per cent. The actual increase of the appropriations for 1891 over the expenditures for 1890 was 8.4 per cent. This table shows that by adding 10 per cent. each successive year to the revenues of the preceding year, and 8.4 per cent. to the expenditures, the service at the close of the fiscal year 1895 will be practically self-sustaining under existing conditions, the deficit being a little more than half a million dollars only.

Table No. 2 takes into account certain items of savings, assuming that the Department was being paid for paper-covered books at third-class rates; for limiting sample copies, by which the same rates can be collected on a large amount of mail matter, and that it were wise and practicable to obtain a reduction of 5 per cent. in the rate of pay for the transportation of the mail. In this connection it may be stated that within fourteen years two such reductions have been made of 10 and 5 per cent., respectively. The saving on paper-covered books is estimated at \$1,000,000; on sample copies, at \$1,100,000; and a 5 per cent. reduction on transportation, at \$1,127,506.41. Applying the total saving of \$3,227,506.41 to the expenditures of the fiscal year 1892, as shown in Table 1, and calculating as before for the successive years a 10 per cent. increase in the revenue and 8.4 per cent. increase in the expenditure, the result shown is that the service would be practically self-sustaining in 1892, with an increasing profit each subsequent year, until it would amount to nearly \$3,500,000 in 1895.

Table No. 3 is a calculation of the same kind, except it is based upon a reduction of 10 per cent. instead of 5 per cent. on the cost of transportation, and it shows a profit of three-quarters of a million dollars for the fiscal year 1892, increasing to nearly \$5,000,000 for the fiscal year 1895.

Table No. 4 takes into account all the items previously mentioned, and in addition assumes what the extra revenue would be if the Department were paid at the rates charged to the public for matter now carried in the mails free, namely: Free newspapers within the county of publication; franked matter, penalty letters of the Executive Departments, and packages of blanks and supplies carried for the same Departments under the penalty label; the total amounting to nearly \$9,000,000. This total sum for which it is claimed the Post-Office Department should at least

have credit is added to the revenues for 1892, and a 10 per cent. increase each successive year being added to the revenues and 8.4 per cent. increase added to the expenditures, the results show an increasing profit from \$8,500,000 in 1892 to over \$15,500,000 in 1895. This table No. 4 is based, it should be stated, upon a 5 per cent. reduction in the cost of transportation.

Table No. 5 is a similar calculation based upon a 10 per cent. reduction in the cost of transportation, and shows increased profits from nearly \$10,000,000 in 1892 to over \$17,000,000 in 1895. In other words, if it were possible to bring about by the 30th of June, 1895, all the conditions assumed in these tables, the result of the whole would be that on the 1st of July, 1895, the postal service would be substantially ready for 1-cent postage, which would entail a loss of only a little more than the profit then accruing.

The preceding is a calculation upon the assumption that the Department is to wait until the 1st of July, 1895, before commencing with 1-cent postage. The next, what would be the results under the same conditions if the Department were to operate under 1-cent postage from the 1st of July, 1891.

Table No. 6 is intended to show the results under the last-mentioned condition of affairs, with a 5 per cent. reduction in the cost of transportation, and it exhibits deficits ranging from \$10,500,000 in 1892 to \$9,700,000 for 1895.

Table No. 7 is a similar calculation based upon a 10 per cent. reduction in the cost of transportation, and exhibits consequently decreased deficits of from \$9,350,000 in 1892 to \$8,260,000 in 1895. These two tables, Nos. 6 and 7, are likewise made upon the assumption that there will be no change in the revenues or expenditures brought about simply by increased volume of business and increased expenditures, due to the stimulus of one-cent postage, other than a normal increase of 10 per cent. each year in the revenues and 8.4 per cent. in the expenditures.

Table No. 8 is the same kind of a calculation based upon a 5 per cent. reduction in transportation, and a 20 per cent. increase for 1893 in the revenues and 5 per cent. due to one-cent postage, an increase of 13.4 per cent. for that year in the expenditures, with normal increases of 10 per cent. in the revenues and 8.4 per cent. in the expenditures for the succeeding years.

Table No. 9 contains no variation from Table No. 8, except that it is founded upon a 10 per cent. reduction in transportation. In other words, these tables assume that

if one-cent postage should be in operation during the fiscal year 1892, the following year there would be an abnormal increase of 10 per cent. in the revenues and of 5 per cent. in the expenditures, due to the stimulus of one-cent postage.

Tables Nos. 10 and 11 are precisely similar calculations, except that they are based upon an abnormal additional increase of $23\frac{1}{3}$ per cent. in the revenues ($33\frac{1}{3}$, or one-third in all) and an additional increase of 10 per cent. in the expenditures (18.4 per cent. in all) during the year following the introduction of one cent postage, with normal increases thereafter.

Table No. 12 is the same as Table No. 2, except that it omits entirely the item of reduction in the cost of transportation.

Table No. 13 is the same as Table No. 4, except that it omits from the calculation any reduction whatever in the cost of transportation.

Tables Nos. 14, 15, and 16 are similar in character to Tables Nos. 6, 8, and 10, except that they omit the item of reduction in the cost of transportation.

TABLE No. 1.

	1890.	1891.	1892.
Service self-sustaining in 1895 under present conditions.	Total revenue	\$66,858,763.40	\$67,298,005.44
	Total expenditures	66,643,083.80	
	Total appropriations		72,320,098.99
	Total estimated expenditures		77,545,804.41
	Deficits	8,780,300.40	5,581,615.19
			2,590,802.03
	1893.	1894.	1895.
Total revenue	\$81,266,035.17	\$82,308,138.68	\$86,154,452.56
Total estimated expenditures	84,059,749.54	91,130,708.50	98,774,813.66
Deficits	2,793,714.37	1,812,629.82	*620,460.31

* Practically self-sustaining.

TABLE NO. 2.

	1890.	1891.	1892.	
Total revenue	\$60,858,783.40	\$67,298,665.44	\$73,955,031.98	Profits shown with certain as- sumed savings.
Savings as follows:				
On paper-covered books.....			1,000,000.00	
On sample copies			1,100,000.00	
On transportation, 5 per cent. reduction			1,127,506.41	
Total			3,227,506.41	
Total expenses	66,645,083.80	72,226,698.99	74,318,388.00	
Deficits	5,786,300.40	5,581,615.19	*363,356.02	

	1893.	1894.	1895.	
Total revenue	\$81,266,035.17	\$89,308,138.68	\$98,154,452.54	
Total expenses	80,561,132.59	87,328,267.72	94,663,842.20	
Profits	704,902.58	1,979,870.96	3,490,610.34	

TABLE NO. 3.

	1890.	1891.	1892.	
Total revenue	\$60,858,783.40	\$67,298,665.44	\$73,955,031.98	
Savings as follows:				
On paper-covered books.....			1,000,000.00	
On sample copies			1,100,000.00	
On transportation, 10 per cent. reduction			2,255,012.83	
Total			4,355,012.83	
Total expenses	66,645,083.80	72,226,698.99	73,190,881.58	
Deficits.....	5,786,300.40	5,581,615.19	†764,150.40	

	1893.	1894.	1895.	
Total revenue	\$81,266,035.17	\$89,308,138.68	\$98,154,452.54	
Total expenses	79,338,915.63	86,003,384.54	93,227,668.84	
Profit.....	1,927,119.54	3,304,754.14	4,926,783.70	

* Practically self-sustaining.

REPORT OF THE POSTMASTER-GENERAL.

TABLE NO. 4.

	1890.	1891.	1892.
Profits shown with free matter paid for.			
Total revenue	\$60,858,783.40	\$67,298,665.44	\$72,955,031.98
Revenue from free matter if paid for:			
Free county			307,141.35
Franked			342,371.68
Penalty letters			6,026,047.88
Penalty supplies			2,203,441.28
Total revenue then			82,534,034.17
Total expenses	68,645,083.80	72,226,698.99	74,318,388.00
Deficit	5,786,300.40	5,581,615.19	*8,515,646.17
	1893.	1894.	1895.
Total revenue then	\$91,117,437.58	\$100,229,181.33	\$110,252,099.48
Total expenses	80,561,132.59	87,328,507.72	94,063,842.29
Profit	10,556,304.99	12,900,913.61	15,588,257.26

TABLE NO. 5.

	1890.	1891.	1892.
Total revenue	\$60,858,783.40	\$67,298,665.44	\$72,955,031.98
Revenue from free matter if paid for:			
Free county			307,141.35
Franked			342,371.68
Penalty letters			6,026,047.88
Penalty supplies			2,203,441.28
Total revenue then			82,834,034.17
Total expenses	68,645,083.80	72,226,698.99	73,190,881.58
Deficits	5,786,300.40	5,581,615.19	*9,643,152.59
	1893.	1894.	1895.
Total revenue then	\$91,117,437.58	\$100,229,181.33	\$110,252,099.48
Total expenses	79,338,915.63	86,003,384.54	93,227,068.84
Profit	11,778,521.95	14,225,796.79	17,024,430.62

* Profit.

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TABLE No. 6.

	1892.	1893.	1894.	1895.
Total revenues, adding expected savings	\$63,834,034.17	\$70,217,437.58	\$77,239,181.33	\$84,963,099.46
Total expenses	74,318,388.00	80,561,132.59	87,328,267.72	94,663,842.20
Deficits	10,484,353.83	10,343,695.01	10,089,086.39	9,700,742.74

TABLE No. 7.

	1892.	1893.	1894.	1895.
Total revenues, adding expected savings	\$63,834,034.17	\$70,217,437.58	\$77,239,181.33	\$84,963,099.46
Total expenses	73,190,881.58	79,338,915.63	86,003,364.51	93,227,668.84
Deficits	9,356,847.41	9,121,478.05	8,764,203.21	8,264,569.38

TABLE No. 8.

	1892.	1893.	1894.	1895.
Revenues	\$63,834,034.17	\$76,600,841.00	\$84,200,925.10	\$92,687,017.61
Expenses	74,318,388.00	84,277,051.99	91,356,324.35	99,030,255.59
Deficits	10,484,353.83	7,676,210.99	7,095,399.25	6,343,237.98

TABLE No. 9.

	1892.	1893.	1894.	1895.
Revenues	\$63,834,034.17	\$76,600,841.00	\$84,200,925.10	\$92,687,017.61
Expenses	73,190,881.58	82,998,459.71	89,070,330.32	97,527,838.06
Deficits	9,356,847.41	6,397,618.71	5,709,405.22	4,840,820.45

TABLE No. 10.

	1892.	1893.	1894.	1895.
Revenues	\$63,834,034.17	\$85,112,045.56	\$93,623,250.11	\$102,985,575.12
Expenses	74,318,388.00	87,992,971.39	95,384,380.98	103,396,668.98
Deficits	10,484,353.83	2,880,925.83	1,761,130.87	411,093.86

TABLE No. 11.

	1892.	1893.	1894.	1895.
Revenues	\$63,834,034.17	\$85,112,045.56	\$93,623,250.11	\$102,985,575.12
Expenses	73,190,881.58	80,638,003.79	93,937,276.10	101,828,007.29
Deficits	9,356,847.41	1,545,958.23	314,025.99	*1,157,567.83

* Profit.

REPORT OF THE POSTMASTER-GENERAL.

TABLE NO. 12.

	1890.	1891.	1892.
Total revenue	\$60,858,783.40	\$67,298,605.41	\$73,055,031.98
Savings as follows:			
On paper-covered books			1,000,000.00
On sample copies			1,100,000.00
Total			2,100,000.00
Total expenses	60,645,083.80	72,226,608.09	75,445,894.41
Deficits	5,786,300.46	5,581,615.19	1,400,862.43
	1893.	1894.	1895.
Total revenue	\$81,260,035.17	\$89,308,124.68	\$98,154,452.54
Total expenses	81,783,349.54	88,653,150.90	96,100,015.57
Deficits	517,314.37	*654,987.78	*2,054,436.97

*Profit.

TABLE NO. 13.

	1890.	1891.	1892.
Total revenue	\$60,858,783.40	\$67,298,605.41	\$73,055,031.98
Revenue from free matter if paid for:			
Free county			307,141.35
Frauded			342,371.68
Penalty letters			6,026,047.88
Penalty supplies			2,203,441.28
Total revenue then			82,834,034.17
Total expenses	60,645,083.80	72,226,608.09	75,445,894.41
Deficits	5,786,300.40	5,581,615.19	*7,388,139.70
	1893.	1894.	1895.
Total revenue			
Total revenue then	\$91,117,437.58	\$100,229,181.33	\$110,252,099.46
Total expenses	81,783,349.54	88,653,150.90	96,100,015.57
Profit	9,334,088.04	11,576,030.43	14,152,083.89

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TABLE NO. 14.

	1892.	1893.	1894.	1895.
Revenues.....	\$63,834,034.17	\$70,217,437.58	\$77,239,181.33	\$84,963,099.46
Expenses.....	75,445,894.41	81,783,349.54	88,633,150.90	96,100,015.37
Deficits.....	11,611,860.24	11,565,911.96	11,413,969.57	11,136,916.11

TABLE NO. 15.

	1892.	1893.	1894.	1895.
Revenues.....	\$63,834,034.17	\$76,000,841.00	\$84,260,925.10	\$92,687,017.61
Expenses.....	75,445,894.41	85,555,644.26	92,742,318.37	100,532,673.11
Deficits.....	11,611,860.24	8,954,803.26	8,481,393.27	7,845,655.50

TABLE NO. 16.

	1892.	1893.	1894.	1895.
Revenues.....	\$63,834,034.17	\$85,112,045.56	\$93,623,280.11	\$102,965,575.12
Expenses.....	75,445,894.41	89,327,938.98	96,831,485.85	104,965,330.06
Deficits.....	11,611,860.24	4,215,893.42	3,208,205.74	1,979,755.54

THE FINANCIAL STATEMENT.

Below are statements of the revenue, expenditures, and actual cost of the postal service for the three fiscal years ending respectively June 30, 1888, June 30, 1889, and June 30, 1890, it being customary to restate the accounts of the two years preceding that for which each report is made, because appropriations are available for two years, and certain items which, when the accounts are first stated, can only be estimated, after the lapse of that time are definitely ascertainable. The variations between expenditures and actual cost of the service are due to taking into account the amounts earned by the Pacific railroad companies for mail transportation and certified to the Secretary of the Treasury in pursuance of the law.

REPORT OF THE POSTMASTER-GENERAL.

Fiscal year ending June 30, 1889.

REVENUE.

1. Ordinary postal revenue.....	\$51, 096, 866.96
2. Receipts from money-order business.....	798, 317.83
Gross revenue.....	<u>52, 095, 174.79</u>

EXPENDITURES AND LIABILITIES.

Expenditures:

From July 1, 1887, to Sept. 30, 1888.	\$55, 793, 357.84
From Oct. 1, 1888, to Sept. 30, 1889.	490, 073.70
From Oct. 1, 1889, to Sept. 30, 1890.	<u>28, 823.47</u>
	56, 284, 255.01

Liabilities:

Outstanding indebtedness for various objects, estimated.....	\$1, 803.66
For transportation of mails on Central Pacific Railroad, not included in amount certified to Secretary of the Treasury.....	308, 504.55
Due Sioux City and Pacific Railroad Company for similar services during the year.	<u>12, 190.17</u>
	322, 307.38

Total expenditures and liabilities for the service of the year	<u>56, 646, 562.39</u>
Deficiency in revenue.....	3, 951, 385.60

COST OF POSTAL SERVICE.

Expenditures and liabilities as above	\$56, 646, 562.39
Amount certified for credit to Pacific railroads from July 1, 1887, to September 30, 1888.....	\$1, 240, 600.83
From Oct. 1, 1888, to Sept. 30, 1889	<u>1, 507.20</u>
Total	1, 242, 108.03
Total cost of service.....	<u>57, 888, 670.42</u>
Excess of total cost of postal service over revenues.	5, 193, 493.63

The receipts were \$3,951,385.60, or 6.9 per cent., less than the expenditures, and \$5,193,493.63, or 9.8 per cent., less than the total cost of the service.

Compared with the previous fiscal year there was an increase of \$3,778,535.02, or 7.8 per cent., in the gross revenue; an increase of \$3,529,888.72, or 6.6 per cent., in the expenditures and liabilities; and an increase of \$3,573,476.92, or 6.5 per cent., in the estimated total cost of the service.

REPORT OF THE POSTMASTER-GENERAL.

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Fiscal year ending June 30, 1889.

REVENUE.

1. Ordinary postal revenue.....	\$55,387,806.37
2. Receipts from money-order business	787,804.81
Gross revenue.....	56,175,611.18
Deduct amount charged to bad debts, compromise and suspense cases	27,596.26
Remaining revenue	56,148,014.92

EXPENDITURES AND LIABILITIES.

Expenditures:

From July 1, 1888, to September 30, 1889	\$61,376,847.24
From October 1, 1889, to September 30, 1890	268,485.15

Liabilities:

Actual indebtedness not reported to Auditor on account of transportation of mails by railroads	17.61
Outstanding indebtedness for various objects, estimated.....	576,646.43
For transportation of the mails on the Central Pacific Railroad, not in- cluded in the amount certified to the Secretary of the Treasury.....	321,146.11
Due Sioux City and Pacific Railroad Company for similar service during the year.....	12,305.24
Total expenditures and liabilities for the service of the year.....	62,555,447.79
Deficiency in revenue	6,407,432.86

COST OF POSTAL SERVICE.

Expenditures and liabilities as above	\$62,555,447.78
Amount certified for credit to Pacific rail- roads from July 1, 1888, to September 30, 1889	\$1,253,673.33
From October 1, 1889, to September 30, 1890	578.13
Total.....	1,254,251.46
Total cost of service.....	63,809,699.24
Excess of total cost of the postal service over revenue.....	7,661,684.32

The receipts were \$6,407,432.86, or 10.2 per cent., less than the expenditures, and \$7,661,684.32, or 13.6 per cent., less than the total cost of the service.

Compared with the previous fiscal year there was an increase of \$3,452,838.13, or 6.6 per cent., in the revenue; an increase of \$5,908,885.39, or 10.4 per cent., in the expenditures and liabilities; and an increase of \$5,921,028.82, or 10.2 per cent., in the estimated total cost of the service.

REPORT OF THE POSTMASTER-GENERAL.

Fiscal year ending June 30, 1890.

REVENUE.

1. Ordinary postal revenue	\$60,657,977.68
2. Receipts from money-order business	824,226.24
Gross revenue	60,882,057.92
Less amount charged to bad debts, compromise and suspense cases	23,314.32
Remaining revenue	60,658,743.60

EXPENDITURES AND LIABILITIES.

Expenditures:

From July 1, 1889, to September 30,
1890

\$65,330,717.11

Liabilities:

Indebtedness for various
objects

\$305,090.39

Outstanding indebted-
ness for various objects,
estimated

76,512.40

For transportation of the
mails on the Central
Pacific Railroad not in-
cluded in the amount
certified to the Secre-
tary of the Treasury ..

320,520.07

Due Sioux City and Pa-
cific Railroad Company
for similar service dur-
ing the year

12,228.83

714,366.69

Total expenditures and liabilities for the service
of the year

65,645,083.80

Deficiency in revenue

5,786,300.40

COST OF POSTAL SERVICE.

Expenditures and liabilities as above	\$66,645,083.80
Amount certified for credit to Pacific railroads	1,207,431.80
Total cost of service	67,852,485.60
Excess of total cost of the postal service over revenue ..	6,993,702.20

The receipts were \$5,786,300.40, or 8.6 per cent., less than the expenditures, and \$6,993,702.20, or 11.4 per cent., less than the total cost of the service.

Compared with the previous fiscal year there was an increase of \$4,710,768.48, or 8.37 per cent., in the revenue; an increase of \$4,089,636.02, or 6.5 per cent., in the expenditures and liabilities; and an increase of \$4,042,786.36, or 6.3 per cent., in the estimated total cost of the service.

ESTIMATES FOR THE FISCAL YEARS ENDING JUNE 30,
1891 AND 1892.

With an average annual increase at the rate of 7.2 per cent. in the revenue for the four years ending June 30, 1889; an increase of 6.7 per cent. for the latter year alone; an increase of 8.37 per cent. for the year just closed, and every reason to suppose that the current year will be an exceptionally prosperous one, it seems proper to count upon an increase of 10 per cent. in the revenues of the present and the next fiscal years. The estimates may therefore be stated thus:

Fiscal year ending June 30, 1891.

Amount of ordinary postal revenue for year ending June 30, 1890	\$60,057,877.68
Increase of 10 per cent.....	6,005,787.76
Estimated amount of ordinary postal revenue....	66,463,665.44
Add revenue from money-order business, upon revised estimates of the superintendent of the money-order system, by letter of October 27, 1890	835,000.00
Gives gross revenue	67,298,665.44

The appropriations for the year amount to \$72,226,698.99, which will not be supplemented by deficiency appropriations, so that upon this basis the deficiency will not exceed \$5,581,615.19.

Fiscal year ending June 30, 1892.

Estimated amount of ordinary postal revenue for the year ending June 30, 1891, as before.....	\$66,463,665.44
Increase of 10 per cent.....	6,646,366.54
Gives estimated amount of ordinary postal revenue for the year.....	73,110,031.98
Amount of estimated revenue from money-order business	845,000.00
Gross revenue for the year.....	73,955,031.98
Amount of estimated expenditures shown in table of estimates submitted by the Postmaster-General through the Secretary of the Treasury.....	77,545,894.41
Leaves estimated deficiency of revenue to be supplied out of general Treasury.....	3,590,862.43

NOT PRACTICABLE.

Daily suggestions in letters, newspapers, and personal calls are made that the Post-Office Department should do a variety of things of which the following are examples, and for which the law does not provide: To try the experiment

of a general parcels-post with packages weighing over four pounds; to stop the Sunday mails; to make free delivery universal; to provide a fractional currency for transmission by mail; to make every post-office a money-order office; to require the use of none but stamped envelopes in order to avoid non-payment of postage; to provide receptacles in street cars for the collection of mail matter; to put letter-boxes at all railroad stations.

In another part of this report will be found some observations in regard to the parcels-post. As to the Sunday mails, the best thoughts of the representative postmasters have been obtained, and the gist of all the opinions is that so long as the mails are carried on railroads so as to arrive at the post-office on Sunday, it is impracticable to discontinue the treatment of mail matter so transported and delivered inside of post-offices without serious embarrassment to general business interests. Then vast accumulations of mail matter would have to be handled on the first business day of the week. Every citizen can stop the Sunday delivery of his own mail if he chooses, and a petition from any community signed by a considerable majority of the patrons of the post-office requesting the closing of an office on Sundays would be regarded with favor by the Department as a means of ascertaining by practical experiment just what the effect of Sunday closing would be.

As to making free delivery universal the Department has already taken the first step to ascertain what is practicable in this direction by obtaining authority of law to test rural free delivery. To make universal free delivery would add millions to the cost of the Department. As to fractional currency for mailing purposes, its provision would be the business of the Treasury Department. It is not the function of the Post-Office Department to issue currency. The postal note is now issued at money-order offices.

It is out of the question to make every post-office a money-order office; for, aside from the fact that it is doubtful whether there is a demand for the system at a large majority of the fourth-class post-offices, there is the further consideration that it would be impossible to obtain from the postmasters of such offices bonds adequate to protect the Government for the valuable supplies intrusted to them. Such widespread extension of the money-order system would furthermore, in virtue of the valuable blanks and funds which would then be stored in every post-office, make such offices the objects of the cupidity of burglars to a far greater extent than they are at present, on account of the

inconsiderable quantities of postage-stamps which they contain.

In regard to the universal use of stamped envelopes it may be said that the Government has no power to coerce the public into the use of a special sort of envelope, whatever advantages might be gained from the adoption of the suggestion. The plan of placing collection boxes on street cars is not a new one, and from what is known of the experiments made in past years seems to be far from practical or advantageous. It did not develop rapid collections. Furthermore, it would involve declaring the lines of every street railway company post-roads, and in times of strikes would subject the mails to the danger of delay or depredation.

It is not practicable to place a letter box at every railroad station for the reasons: First, that the mail trains do not stop at every station and frequently do not stop at many stations; second, that when they do stop it is not possible or proper for the postal clerk to leave his car for the purpose of making collections from the box; third, that it would not be feasible to require the postmaster, whose office in many instances is at a distance from the station, to visit the latter at train time for the purpose of depositing the contents of the boxes in the cars; and fourth, if the railway postal clerk should be charged with the duty of emptying the boxes, he might carry the mail in the direction opposite to that intended.

PERSONAL.

I regret extremely the retirement of Mr. Clarkson, whose deserved popularity, and efficiency as an executive in the difficult position of First Assistant, have been equaled only by the loyalty and warmth of his personal friendship to me. But the Department, as I also desire to record, is fortunate in having the experience and endeavor of Colonel Whitfield, Mr. Lowrie Bell, Captain White, Captain Brooks, and the others, who have been promoted to the more important posts to which their successes have entitled them. I am grateful to all the officials and employes of the Department, in and out of Washington. What I accomplish is with their assistance.

Very respectfully, your obedient servant,

JOHN WANAMAKER,

Postmaster-General.

PAPERS

ACCOMPANYING

REPORT OF THE POSTMASTER-GENERAL.

REPORT OF HOUSE LETTER-BOX COMMISSION.

HON. JOHN WANAMAKER,
Postmaster-General, Washington, D. C. :

SIR: The commission appointed by you in June, 1890, for the purpose of recommending a device for letter-boxes for the doors of dwellings, beg leave to submit the following report:

MODELS AND DESIGNS SUBMITTED.

Number of Boston models	63
Number of New York models	50
Number of St. Louis models	59
Number of Washington models	215
Total.....	387
Number of Boston designs.....	46
Number of New York designs.....	37
Number of St. Louis designs	23
Number of Washington designs.....	61
Total.....	177

To which may be added about two hundred communications containing suggestions of more or less value. Some sixty-five gentlemen appeared personally before the commission, or committee of its members, and explained their models.

THE INEXPERIENCE OF THE COMMISSION.

The commission, on assembling, discovered that owing to their previous limited experience in connection with house letter-boxes they were unable to determine exactly what they wanted, or what the public service required in the shape of a box; and it was not until after a careful examination of many of the models that they could approximate towards anything like the necessary requirements for a box to recommend to the Postmaster-General.

ESSENTIAL REQUIREMENTS OF A SATISFACTORY BOX.

The commission, after mature deliberation, outlined the essential requirements of a satisfactory box as follows:

- (1) It should be of small cost.
- (2) It should be neat in appearance.
- (3) It should protect the contents against rain, sleet, snow, and dust.
- (4) It should furnish reasonable security against removal of the letters by thieves, and against the removal of exterior boxes from doors or walls.
- (5) It should be as simple as possible in its manner of operation.

- (6) The lid or cover of the box should be so hung as not to require the carrier to open it or to use more than one hand in depositing the mail.
 - (7) The box should mar the door as little as possible.
 - (8) The box should have an attachment of some character for the reception of papers.
 - (9) It should disclose the presence of mail matter without being opened.
- These are the affirmative requirements of a suitable box.

CONCLUDING RECOMMENDATION.

We are not prepared to recommend the adoption by the Post-Office Department of any of the devices submitted to us. It would seem that an intelligent consideration of the subject by post-office officials and inventors ought to discover improvements upon anything which has been presented. We would respectfully recommend that no official action be taken at present, but that the subject be left open and that the requirements for a box similar to those suggested by the commission in this report be laid before inventors and others interested, as far as possible, and models solicited based upon these requirements, or that such steps be taken as may occur to the Postmaster-General to complete the consideration of the subject.

We beg to call your attention to the faithful co-operation in our labors of the Chief Clerk of the Department, Mr. W. B. Cooley, and also the diligence and fidelity of Mr. W. E. Corbin, secretary of the commission; and Mr. Zane, stenographer.

C. VAN COTT,
Postmaster, New York, N. Y.

J. B. HARLOW,
Postmaster, St. Louis, Mo.

HENRY SHERWOOD,
Postmaster, Washington, D. C.

JAMES E. BELL,
Superintendent Delivery, Washington, D. C.

W. B. SMITH,
Acting Inspector in Charge, Washington, D. C.

JNO. M. CORSE (Chairman).
Postmaster, Boston, Mass.

WASHINGTON, October 13, 1890.

THE FIRST CENTURY OF THE POSTAL SERVICE.

This year's operations begin the history of the second century of the American postal system. When the Post-Office Department began its career in 1789, Congress seemed hardly willing to give it an organized existence. The act which authorized its creation—or, rather, which continued in operation the old establishment of the confederation—expressly provided that it should last “until the end of the next session of Congress, and no longer;” and this temporary measure was renewed year after year for several sessions, until in 1794 a permanent establishment was provided for.

One of the first aims of Alexander Hamilton, the Secretary of the Treasury, after the Government of the Constitution had been fairly inaugurated, was to devise some means by which the postal establishment could be made to serve the public with the greatest attainable efficiency. In some parts of the country a regular system of arrivals and departures of the mails had never been established; stage-drivers and post-riders were permitted to carry and deliver letters, without any hinderance, for their own private emolument; almost all money transactions were in the currency not of the National Government, but of the several States, and this currency was of fluctuating value according to circumstances and localities; the rates of postage were very high and complex. They were, for example:

For every single letter not exceeding 30 miles, 6 cents.

For every single letter over 30 miles, and not exceeding 60 miles, 8 cents.

For every single letter over 60 miles, and not exceeding 100 miles, 10 cents.

For every single letter over 100 miles, and not exceeding 150 miles, 12½ cents.

For every single letter over 150 miles, and not exceeding 200 miles, 15 cents.

For every single letter over 200 miles, and not exceeding 250 miles, 17 cents.

For every single letter over 250 miles, and not exceeding 350 miles, 20 cents.

For every single letter over 350 miles, and not exceeding 450 miles, 22 cents.

For every single letter over 450 miles, 25 cents.

For every double letter, double the said rates.

For every triple letter, triple the said rates.

For every package weighing 1 ounce avoirdupois, to pay at the rate of four single letters for each ounce, and in that proportion for any greater weight.

Not a daily mail existed anywhere; the number of post-offices in the whole country did not exceed a hundred; the length of all mail-routes was about 2,000 miles; and the entire annual revenue of the service was considerably less than \$50,000. Such was the condition of the postal establishment under Samuel Osgood, the first Postmaster-General under the Constitution.

HALF A CENTURY LATER.

Nearly half a century later, however—in 1835—when the locomotive began to replace the pony in the conveyance of the mails, the number of post-offices in the United States had increased to more than 10,000, the gross amount of postal receipts to nearly \$3,000,000 in one year, and the length of post-routes to 112,000 miles. The postal establishment was no longer insignificant, but the rates of postage were still excessive; the transmission of the mails was slow and infrequent; there probably were not more than twenty offices in all the land supplied by a daily mail. There had been little done to indicate that spirit of liberality and progress which should always be the animating principle of the postal service. The country during this period was in many places a wilderness, and the difficulties under which the mails had to be transported are almost ludicrous when we think of them now. In 1800, for illustration, Gideon Granger, then Postmaster-General, in a communication to the House of Representatives, makes the following queer recommendations concerning the transportation of the mails between Athens, Ga., and New Orleans, La.:

"This part of the route ought to be surveyed and marked out, and cleared of underbrush and trees 4 feet wide. It would be rather an injury than an advantage to clear wider than is necessary for a single horse, as it has been found to encourage a thick growth of brush.

"Dog River is 40 feet wide, and is too deep to ride whenever there is considerable rain. Two logs may be laid across it, so as to enable the rider to cross with the mails on his back, and swim his horse alongside.

"Pascagoula River is 250 yards wide. A family lives here and keeps a canoe, in which the rider with the mail should be crossed, the horse swimming alongside of the canoe."

This same Postmaster-General, in 1810, congratulates the House of Representatives upon the tremendous strides in the pathway of progress made by his Department. He says that at the beginning of the century—

"It required to write from Portland to Savannah and receive an answer forty days; now it requires twenty-seven. Then it required thirty-two days between Philadelphia and Lexington, Ky.; now it requires sixteen. Then it required forty-four days between Philadelphia and Nashville; now it requires thirty. Then it required between New York and Canandaigua twenty days; now twelve."

The illiberal spirit actuating the postal officers of that period is exemplified by the following extract from a letter addressed by R. J. Meigs, the Postmaster-General in 1823, to the chairman of the Committee on the Post-Office and Post-Roads of the House of Representatives:

"It appears to me that no book ought ever to be sent by mail, even if letter or packet postage was paid on it. It is an article which is not, like letters and newspapers, valuable only for its quick conveyance, and may well be sent by the usual routes of many articles of merchandise.

"Some years ago the postmasters at many of the places where books were printed construed them as subject only to pamphlet postage. The consequence was that the mails were soon overloaded with novels and the lighter kinds of books of amusement; and I was under the necessity not only of correcting this misconception of the rate of postage, but to prohibit postmasters from sending books in any case through the mail.

"It would be useful to prohibit by law the transmission of books by mail. The Secretary of State has during the last summer sent a number of cart-loads of books in this manner. The consequence has been the mails have been overloaded, and it has occasioned demands probably of twice as much as it would have cost to send them by means of the booksellers through the ordinary channels, and many newspapers have been rubbed to pieces and lost, and letters damaged."

Twenty-five years later, in 1860, the number of post-offices had increased to over 28,000, the gross postal revenue had more than doubled, and the entire length of post-

routes had grown to 240,000 miles. This period (from 1835 to 1860), one would suppose, should have been the most prosperous in the history of the postal service; for during that time steam as a motive power had come to a wonderful degree of development, the country had increased greatly in population, wealth, and enlightenment, and the quick transmission of intelligence by means of the post had become one of the greatest public necessities. But there is nothing very brilliant in this page of postal history.

One instance alone of its mismanagement, the magnetic telegraph, which, though at one time actually under the control of the Post-Office Department, brought into existence by means of public appropriations, with its inventor and all his collaborators employed as postal officers, was abandoned by the Government and suffered to be monopolized and enjoyed by private corporations.

THESE LAST THIRTY YEARS.

From 1860 to the close of the fiscal year lately ended—June 30, 1890—the progress of the postal establishment has been most marvelous. The number of post-offices has more than doubled, the aggregate now being 62,401; the total length of all the mail-routes in the country, not including letter-carrier routes in the cities, has increased to about 428,000 miles, and the gross postal revenue has grown to a little less than \$61,000,000, representing an increase over the revenue of 1860 of more than 600 per cent. The free-delivery service, which now, in 454 cities of the country and by means of more than 9,000 carriers, makes deliveries and collections of the mails, without extra tax, to the doors of the citizens, has been added. The great money-order system has been established, a system under which, at any one of 3,322 post-offices, remittances, in sums from one cent to a hundred dollars, may be made to every part of the world with absolute safety, and which is used so largely by the people to-day that the amount of its annual business in the issue and payment of orders is nearly \$255,000,000.

Another great step in the progress of the postal service—the evolution, from an immature state, of the railway-mail or traveling post-office system, by which, owing to minute distribution en route on railroads and steam-boats, and by means of immediate transfers to connecting lines, the mails are now carried with the utmost expedition from the places of mailing to those of delivery—was effected during the period under consideration.

Still another great stride in the march of the postal service was the passage of laws that created two great railways across the continent—the forerunners of several others—reducing the time of mail communication between New York and San Francisco or Portland from three weeks to six days, and through the naturally resulting establishment of mail service with China and Japan, opening up direct intercourse with all of Asia and the islands of the Pacific. The direct effect was rapidly to develop all the region west of the Mississippi River, forming populous and prosperous communities where before only the Indian and the buffalo had roamed. Their indirect effect has been, by linking America with Asia, and thus completing the chain of mail service around the earth, to show the practicability, if not to suggest the inauguration, of that splendid scheme of postal intercourse known now as the Universal Postal Union, whose purpose it is to unite in a sort of brotherhood all the nations of the world, making their countries a single territory, and subjecting them, so far as postal matters are concerned, to the operation of equal and exact laws.

The period we are considering, too, has been signalized by numerous reductions in the rates of postage on all classes of mail matter, so that instead of the varying and oppressive rates of former times, we have now, taking everything into consideration, perhaps a lower and simpler tariff of postage than any other country in the world; and by a great extension in the scope of the mails, which now take in books, all kinds of printed matter, and almost every variety of small merchandise. The registry system has been extended to furnish more than ordinary security.

Of minor importance, but still indicating enlightened advancement during the period in question, have been the introduction of the postal-note system, giving the people to some extent the benefits of a fractional paper currency; the adoption of stamped newspaper wrappers and special request envelopes, the latter securing the direct return of a letter to its writer, if undelivered, without the delay of its passage through the Dead Letter Office; the universal use of stamps for the payment of postage on mail matter, both that which is due at the time of mailing and that due at the place of destination; and the special-delivery system, by which for a moderate fee immediate delivery of mail matter is secured upon its arrival at any post-office.

The postal establishment of the United States has arisen from a condition of insignificance to be the largest of all the nations of the world. Instead of one little room, which in 1789 was sufficient to accommodate the entire central force of the Post-Office Department, a building four stories high, and covering an entire block in Washington, is now inadequate, to say nothing of the great post-office structures

all over the land. Instead of the post-boy on his lazy horse, coming and going at will between straggling villages along a single line of post-roads, with here and there a diversion to a cross-road, as was the way in Osgood's time, the mails are now transported almost with the speed of thought, according to fixed schedules of arrival and departure, over such innumerable routes as to make their aggregate journeys every working day equivalent to forty-one times the circuit of the earth. From a total business of perhaps a thousand letters a day, which is but a trifle less than the estimate of the Postmaster-General in 1789, letters and other pieces of mail matter are steadily dropping into the numberless receptacles of the postal system at the rate of nearly 8,000 a minute. This marvelous system employs more than 150,000 agents.

REPORT OF THE CHIEF POST-OFFICE INSPECTOR.

POST-OFFICE DEPARTMENT,
OFFICE OF CHIEF POST-OFFICE INSPECTOR,
Washington, D. C., October 21, 1890.

SIR: I have the honor to submit herewith for your information a number of statistical tables showing the workings of the force of post-office inspectors during the fiscal year ended June 30, 1890. I have appended to each table explanatory comments of my own which, taken with the tables, form a report of the work of the office and its agents for the year.

The duties of inspectors may be generally classed as of two distinct kinds—the work growing out of depredations upon the mails and miscellaneous work which does not relate to nor have its origin in the former. These two kinds of duties the statistics exhibited in the following tables explain. With the former the general public is more directly concerned, and with the latter the postal service, in all its branches, which has come to be termed “the Department.” How much, then, depends on faithful performance of these two kinds of duty. The public feels losses keenly and cries out loudly when it suffers from the dishonest pilferer of letters, and the inspector must respond quickly and successfully to meet the demands put upon him in this direction. So much depends upon the safe and speedy delivery of letters that the public becomes the best critic in many cases.

With the watchful eyes of fraternal branches of the Department over his movements, the inspector must exercise great care and delicacy in the performance of tasks committed to him by those branches, for on his judgment and on his reports depend, in a large measure, the action and policy of the Department. I think I may be pardoned for the feeling of satisfaction that impels me to report that the officers of this branch of the service have had an eye single to their duties both toward the public and the Department. They have been ever zealous and faithful in their efforts to correct wrong, to make the crooked straight, to cast light upon dim questions, and to lend assistance in clearing the way to a good postal service. The first class of duties mentioned has its origin largely in the complaints of the public in the treatment of its mail-matter. This is of two kinds—registered and ordinary. Experience long ago separated these two classes of complaints and in the office gave them separate designations with appropriate subdivisions.

There were received during the year 7,369 complaints of all kinds, and of these 6,990 were complaints of depredations upon registered

letters and 379 upon registered packages (third and fourth class matter); 2,725 complaints were of rifling; 3,927 were of loss of the entire letter or packet; 327 loss of the letter or package from the accompanying registered package envelope; 68 complaints of detention were received; 144 of wrong delivery; 57 of tampering; and 120 others of various wrongs. Of these 7,369 complaints 4,714 have been investigated and reported upon during the year.

Investigation showed that no loss had occurred, either to sender or addressee, in 2,763 cases, the letter or packet having been safely delivered or the cause of complaint groundless. Of the reported cases of rifling, investigation showed that in 143 cases no inclosure was made by the sender; in 328 no rifling had occurred (all that was inclosed had been received); 66 cases of rifling occurred either before mailing or after delivery, thus relieving the Post-Office Department of blame; and 44 cases of reported lost registered matter were found not to have been registered at all, either having been sent in the ordinary mail or not mailed. Loss was found to have occurred in 1,951 cases. A careful scrutiny of Exhibit B will show to what causes the loss was attributable. It is gratifying to state that of these losses only 666 cases are chargeable to the dishonesty or carelessness of postal employes. But by application of the disciplinary rules of the service reimbursement was required and recovery of stolen amounts was made in 489 cases; the lost articles or valuables were traced into the Dead Letter Office and restored to the owners in 183 cases, and in 67 cases voluntary reimbursement was made by the party at fault before the loss was reported to the Department. This leaves 1,117 cases in which the cause of the loss was ascertained, but in which no one was at fault or in which under the circumstances no recovery could be made. There were also 105 cases in which no trace of the reported lost matter could be found, making in all 1,222 cases in which actual loss was ascertained to have occurred.

There were on hand July 1, 1889, 2,667 cases, and of these 2,083 were investigated and loss was found to have occurred in 568 cases, or a little more than 27 per cent. Now, taking this percentage as a basis and assuming that as great a percentage of loss will be found to have occurred in the 2,655 cases of the fiscal year uninvestigated, we have 616, which added to the 1,222 cases in which loss was by investigation found to have occurred, we have a total ascertained and estimated loss of 1,838. This compared with the total number of domestic registered pieces handled during the year, viz, 14,148,564, shows a loss of 1 piece for every 7,697 handled.

REPORT OF THE FIRST ASSISTANT POSTMASTER-GENERAL.

POST OFFICE DEPARTMENT,
OFFICE FIRST ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., November 22, 1890.

SIR: I have the honor to submit the following report of the work of this Bureau for the fiscal year ended June 30, 1890:

APPOINTMENT DIVISION.

Post-offices established and discontinued, postmasters appointed, and the increase or decrease as compared with the previous year.

Post-offices.	June 30, 1889.	June 30, 1890.	Increase.	Decrease.
Post-offices established during the year.....	2,770	4,427	1,657	
Post-offices discontinued during the year.....	1,147	1,025		122
Net increase over previous year.....	1,623	3,402	1,779	
Whole number of post-offices.....	58,909	62,401	3,492	
Number of presidential.....	2,684	2,728	44	
Number of fourth-class.....	56,215	59,673	3,458	

Appointments during the year.

Appointments.	June 30, 1889.	June 30, 1890.	Increase.	Decrease.
On resignations and expirations of term.....	8,552	8,919	366	
On removals.....	7,853	6,569		1,284
On offices becoming presidential.....	261	134		127
On deaths of postmasters.....	253	673	420	
On establishment of post-offices.....	2,770	4,427	1,657	
Total.....	20,030	20,722	2,143	1,431

Total appointments during the year.....	20,722
Total offices discontinued.....	1,025
Number of names and sites changed.....	1,242

Total cases acted upon..... 22,989

The number of new offices established and the increase in the number of post-offices, arranged by sections, States and Territories, were as follows:

States and Territories.	Estab- lished.	Increase.
<i>New England States.</i>		
Maine.....	63	28
New Hampshire.....	14	7
Vermont.....	23	11
Massachusetts.....	27	16
Rhode Island.....	10	9
Connecticut.....	20	21
Total.....	157	82
<i>Middle States and District of Columbia.</i>		
New York.....	125	40
New Jersey.....	30	24
Delaware.....	13	3
Maryland.....	64	49
Pennsylvania.....	316	215
District of Columbia.....	3	
Total.....	571	379

States and Territories.	Estab- lished.	Increase.
<i>States and Territories on Pacific Slope.</i>		
Oregon	114	60
California	162	72
Nevada	24	11
Washington	167	125
Arizona	17	10
Alaska	3	2
Total	487	280
<i>Southern States and Indian Territory.</i>		
Virginia	241	165
West Virginia	180	128
North Carolina	252	159
South Carolina	110	59
Georgia	264	133
Florida	117	54
Alabama	246	175
Mississippi	153	94
Louisiana	97	58
Texas	255	142
Arkansas	182	84
Missouri	202	134
Tennessee	224	155
Kentucky	238	173
Indian Territory	148	102
Total	2,900	1,815
<i>States and Territories of the West and Northwest.</i>		
Ohio	166	117
Indiana	96	63
Michigan	116	68
Illinois	98	49
Wisconsin	112	83
Iowa	102	45
Minnesota	103	52
Kansas	88	23
Nebraska	79	37
Colorado	120	67
Dakota (North and South included)	117	87
New Mexico	86	28
Montana	79	46
Wyoming	55	42
Idaho	46	33
Utah	23	9
Total	1,436	840

The greatest increase in the number of post-offices in any of the States for the year was 215 in Pennsylvania. In Alabama the increase in number was 175; Kentucky, 173; Virginia, 163; North Carolina, 159; Tennessee, 155, and Texas, 142. The largest increase for the previous year was 121 in Pennsylvania. There was no decrease in any of the States or Territories in the number of offices.

In each of eleven of the States there were upwards of two thousand offices in operation on June 30. The following are the States and the whole number of offices:

Pennsylvania	4,570
New York	3,406
Ohio	3,073
Virginia	2,706
North Carolina	2,511
Illinois	2,401
Missouri	2,389
Tennessee	2,273
Texas	2,248
Kentucky	2,214
Indiana	2,056

In only nine of the States are there one hundred or more Presidential offices. Those are as follows:

New York.....	240
Pennsylvania.....	200
Illinois.....	190
Ohio.....	154
Massachusetts.....	144
Michigan.....	137
Iowa.....	136
Kansas.....	129
Indiana.....	100

DIVISION OF SALARIES AND ALLOWANCES.

DUTIES ASSIGNED TO THE SALARY AND ALLOWANCE DIVISION.

The most important duties are the adjustment of salaries of Presidential postmasters, or postmasters of the first, second, and third classes; consideration of applications for clerk-hire, rent, fuel, light, furniture, miscellaneous and incidental expenses for first and second class post-offices, and rent, fuel, and light for third-class offices; examination of the quarterly returns, or accounts of postmasters at offices of the first and second classes, before finally passed by the Auditor of the Treasury for the Post-Office Department; the regulation of the salaries and duties of employes necessary for the proper transaction of the postal business in the first and second class post-offices; the supervision and regulation of the box-rent rates and deposit for keys for lock-boxes, and the large and constantly increasing correspondence relative to the subject-matters stated.

Additional duties have been imposed upon the salary and allowance division by the act of Congress which provides that clerks doing money-order business at offices of the first and second classes shall be compensated from the allowance for clerk-hire. The apportionment for salaries of money-order clerks at first and second class offices is now made through the salary and allowance division, and the commissions accruing on money-order accounts are returned under existing law as a part of the revenue of the Department.

The act of Congress approved March 3, 1883, which requires an annual adjustment of the salaries of Presidential postmasters, to take effect at the beginning of each fiscal year (July 1), instead of the biennial adjustment as heretofore authorized, also largely increases the work of this division. The *seventh annual* adjustment of the salaries of Presidential postmasters was made upon the basis of the gross receipts which accrued at the respective offices for the four quarters ended March 31, 1890. The recent law providing for allowances for rent, fuel, and light for third-class post-offices, or offices whereat the salaries of postmasters are fixed from \$1,000 to \$1,900 per annum, has also greatly increased the work of the division. By the adjustment of the salaries of Presidential postmasters, which took effect July 1, 1890, 2,147 offices were assigned to the third class, being an increase of 114 offices as compared with the number of third-class offices July 1, 1889.

Additional duties of an important character have been assigned to this division on account of the act of Congress approved March 2, 1889, relative to the classification and the fixing of the salaries of clerks attached to first and second class post-offices; and, also, by the act of

Congress approved October 1, 1890, relative to leaves of absence of not exceeding fifteen days in any one fiscal year, with full pay, for clerks and employes attached to first and second class post-offices.

Very respectfully,

S. A. WHITFIELD,
First Assistant Postmaster-General.

Hon. JOHN WANAMAKER,
Postmaster-General.

REPORT OF THE SECOND ASSISTANT POSTMASTER-GENERAL.

POST-OFFICE DEPARTMENT,
OFFICE OF SECOND ASSISTANT POSTMASTER-GENERAL,
Washington, November 7, 1890.

SIR: I have the honor to submit the following report of the office of the Second Assistant Postmaster-General for the year ended June 30, 1890:

MAIL SERVICE IN GENERAL.

The annual rate of expenditure for inland mail transportation on June 30, 1890, was—

For 15,887 star routes, aggregating 237,456.81 miles in length.....	\$5,411,666.06½
For 6,714 mail-messenger routes, aggregating 5,245.33 miles in length.....	1,019,287.56
For 129 steam-boat routes, aggregating 10,456.42 miles in length.....	462,819.72
For 2,176 special-offices routes, aggregating 20,052.81 miles in length.....	42,840.13
For 2,199 railroad routes, aggregating 154,779.35 miles in length.....	20,869,231.55
For 172 railway post-office car routes, aggregating 29,665.14 miles in length.....	2,526,000.11
For 5,836 railway post-office clerks.....	5,818,655.00
For mail equipments.....	247,515.15½
For necessary and special facilities on trunk lines.....	295,421.78
Total.....	36,693,437.07

Comparison with the report for June 30, 1889, shows:

Star service.—For the star service an increase of 810 routes, an increase of 4,125 miles in length of routes, and an increase of \$183,278.99½ in the annual rate of expenditure. The number of miles traveled per annum was 95,160,918.76, at a cost of 5.68 cents per mile; the average number of trips per week was 3.85; an increase of 5,383,318.06 in the number of miles traveled per annum, a decrease of 0.14 cent in the rate of cost per mile, and an increase of 0.16 in the average number of trips per week.

Regulation wagon service.—In regulation wagon service (included in the star service) there were 36 routes, aggregating 507.04 miles in length; the annual rate of expenditure was \$451,048.14; the number of miles traveled per annum, 1,945,290.37; the rate of cost per mile, 23.18 cents; the average number of trips per week, 36.89; an increase of 6 routes, of 106.34 miles in length of routes, of \$47,318.40 in annual rate of expenditure, and of 428,945.72 in the number of miles traveled per annum; a decrease of 3.44 cents in the rate of cost per mile, and an increase of 0.51 in the average number of trips per week.

Special-office service.—For the special-office service, an increase of 177 routes, of 5,225.15 miles in length of routes, and a decrease of \$3,792.03 in annual expenditure. The number of miles traveled per annum (estimated on a basis of 1.79 average trips per week) was 3,733,971.64, at a cost of 1.14 cents per mile; the average number of trips per week, as estimated, was 1.79; an increase over the estimate for 1889 of 763,904.08 in the number of miles traveled per annum, a decrease of 0.39 cents in the rate of cost per mile, and an increase of 0.69 in the average number of trips per week.

Mail-messenger service.—For mail-messenger service, an increase of 370 routes, of 222.06 miles in length of routes, of \$70,098.71 in annual rate of expenditure. The number of miles traveled per annum was 9,563,017.40, at a cost of 10.65 cents per mile; the average number of trips per week was 17.53; a decrease of 1,218,73.49 in the number of miles traveled per annum, an increase of 1.85 cents in the rate of cost per mile, and a decrease of 3.10 in the average number of trips per week.

Steamboat service.—For the steamboat service an increase of one route, a decrease of 141.45 miles in length of routes, and an increase of \$16,787.24 in annual rate of expenditure. The number of miles traveled per annum was 3,236,806.05, at a cost of 14.29 cents per mile; the average number of trips per week was 2.97; an increase of 66,531.79 in the number of miles traveled per annum, an increase of 0.23 cent in the rate of cost per mile, and of 0.10 in the average number of trips per week.

Railroad service.—For the railroad service, an increase of 86 routes, of 4,397.82 miles in length of routes, and of \$1,428,133.77 in the annual rate of expenditure for transportation. The number of miles traveled per annum was 215,715,689.17, at a cost of 9.67 cents per mile for transportation; the average number of trips per week was 13.40; an increase of 11,523,191.09 in the number of miles traveled per annum, of 0.15 cent in the rate of cost per mile for transportation, and of 0.35 in the average number of trips per week.

Railway post-office car service.—For the railway post-office car service an increase of 16 routes, of 3,005.29 miles in length of routes, and of \$327,482.56 in the annual rate of expenditure.

Railroad service (including railway post-office car service).—For the railroad service (including the railway post-office car service) the annual rate of expenditure was \$23,395,231.66; the rate of cost per mile traveled was 10.84 cents; an increase of \$1,755,618.33 in the annual rate of expenditure and of 0.25 cent in the rate of cost per mile.

Railway post-office clerks.—For railway post-office clerks, an increase of 388 in the number of clerks, and of \$350,055.00 in annual rate of expenditure.

Mail equipments.—For mail equipments, an increase of \$50,834.32 in annual rate of expenditure.

Necessary and special facilities on trunk lines.—For necessary and special facilities on trunk lines, a decrease of \$233.60 in annual rate of expenditure.

The sums actually disbursed appear in the Auditor's report.

The number of contracts drawn in duplicate during the year was 5,989, a decrease of 704 from the number for the preceding year.

RECAPITULATION.

Summary of all classes of mail service in operation June 30, 1890:

Number of routes, 27,105; length of routes, 427,990.72 miles; annual rate of expenditure, \$36,693,437.97; number of miles traveled per an-

num, 327,409,493.02; rate of cost per mile traveled, 11.20 cents; rate of cost per mile of length, \$85.73; average number of trips per week, 7.35; an increase of 1,444, or 5.02 per cent., in the number of routes; of 11,831.58 miles, or 2.84 per cent., in length of routes; of \$2,617,719.96, or 7.68 per cent., in the annual rate of expenditure; of 16,507,608.73, or 5.30 per cent. in the number of miles traveled per annum; of 0.24 cent, or 2.18 per cent., in the rate of cost per mile traveled; of \$3.85, or 4.70 per cent., in the rate of cost per mile of length; and of 0.17, or 2.36 per cent., in the average number of trips per week.

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REPORT OF THE GENERAL SUPERINTENDENT OF RAIL- WAY MAIL SERVICE.

POST-OFFICE DEPARTMENT,
OFFICE OF THE GENERAL SUPERINTENDENT
OF RAILWAY MAIL SERVICE,
Washington, D. C., November 3, 1890.

SIR: I have the honor to submit herewith statistical tables and statements exhibiting in detail the operations of this service for the fiscal year ended June 30, 1890, which may be summarized as follows:

EXTENT OF SERVICE.

The records of this office show that up to the 30th of June, 1890, mail service was in operation on 154,779.35 miles of railroad in the United States. Postal clerks were employed in the distribution of the mails on 137,564.12 miles; service on the remainder, namely, 17,215.23 miles, having been performed by means of closed pouches carried on trains on which no distribution is made.

EQUIPMENT OF RAILWAY POST-OFFICE LINES.

At the close of the fiscal year the rolling stock of railway post-office lines consisted of 439 whole cars in use and 103 in reserve; 1,760 apartment cars in use and 475 in reserve, making an aggregate of 2,777 cars; the increase over the number covered by the last annual report being 43 whole cars in use, 9 whole cars in reserve, and 80 apartment cars in use and a decrease of 10 in reserve, making the net increase 122.

EXTENT OF THE RAILWAY MAIL SERVICE AND FORCE EMPLOYED

On the 30th of June, 1890, there were 39 inland steam-boat lines in operation, aggregating 5,296 miles of route, on which postal clerks were employed. There were employed in handling and distributing the mails in transit on railroad routes 5,314 and on steam-boat routes 51 railway postal clerks, making a total of 5,365 men at work on lines. While engaged in the separation and distribution of the mails these postal clerks on railroad routes traveled during the year (in crews) 132,654,779 miles, and those employed on steam-boat lines 1,825,605 miles; and while en route they distributed 7,847,723,600

pieces of ordinary mail, and receipted for, recorded, protected and distributed 16,576,293 registered packages and cases, and 1,138,208 through registered pouches and inner registered sacks.

To the 150,038.53 miles of railroad service in operation July 1, 1889, 4,397.82 miles of new service have been added during the fiscal year under review, being an increase of 2.84 per cent. The lines on which service was performed by clerks show an increase of 4,453 miles, or 3.35 per cent. The mileage of the closed-pouch lines decreased from 17,271.10 on June 30, 1889, to 17,215.23 miles on June 30, 1890, being a reduction of 147.78 miles, or .86 per cent. The annual mileage of this class of service for the fiscal year ended June 30, 1889, was 18,168,821 miles, and for the year ended June 30, 1890, 19,648,763 miles; an increase of 1,479,942 miles, or 8.14 per cent., and the number of pouches exchanged daily increased 3,209, or 22.38 per cent.

The number of clerks at work on railroad lines increased from 4,947 on June 30, 1889, to 5,314 on June 30, 1890, and the distance from register to register from 147,970.94 to 154,098.03 miles, being an increase of 367 in the number of clerks and 6,127.09 miles in distance. The number of clerks employed on steam-boat lines remained the same as for the previous year; the length of routes decreased 147.74 miles in distance; but the annual miles of service increased 24,098 miles.

On the 30th of June, 1889, there were 5,448 clerks in the service, and on the corresponding date of 1890 there were 5,836 on the roster, being an increase of 388 men, or 7.12 per cent., while the record of distribution shows that the amount of work done increased 11.60 per cent.

The entire force was employed as shown in the subjoined table:

Fiscal year ended—	No. of clerks employed on railroad lines.	No. of clerks employed on steam-boat lines.	No. detailed to transfer duty.	No. detailed to office duty.	Total
June 30, 1890.....	5,314	51	249	222	5,836
June 30, 1889.....	4,947	51	284	216	5,448
Increase	367	.....	15	6	28

QUANTITY OF MAIL HANDLED.

The total number of pieces of all classes of mail handled during the year was 7,865,438,101, and 2,812,574 errors of all kinds were checked against postal clerks, showing that 99.96 per cent. of all mail handled was correctly distributed. The increase in the number of pieces handled was, as previously stated, 11.60 per cent.

REGISTERED MATTER HANDLED.

During the fiscal year ended June 30, 1889, 15,866,550 registered packages and cases, and 1,134,918 through registered pouches were distributed, while for the succeeding fiscal year 16,576,293 registered packages and cases and 1,138,208 through registered pouches and inner registered sacks were handled, an increase of 709,743 in the number of packages and cases and 3,290 in the number of through registered pouches and inner registered sacks. The percentage of increase being 4.50 and .29, respectively.

In addition to the number of pieces of ordinary and registered mail distributed in transit, there were separated and arranged in railway

post-offices for immediate delivery to addressees upon the arrival of trains 225,807,825 pieces of letter mail and 621,750 newspapers. The increase over the number of letters reported for last year being 59,672,515, or 35.9 per cent., and of newspapers 38,250 pieces, or 6.55 per cent.

NIXIES.

All mail matter not addressed to post-offices, or otherwise so incorrectly, illegibly, or insufficiently addressed that it can not be transmitted with any degree of certainty that it will reach the person for whom it was intended is, in the nomenclature of this service, called "nixie." These nixies are withdrawn from the mails and sent to certain designated post-offices in the division in which the matter originated, for proper disposition. During the year 4,628,931 pieces of the nixie matter were handled, of which 2,186,993 pieces, or 47.2 per cent., were either forwarded to destination or returned to sender.

This is a matter in which it is believed that every patron of the postal service is more or less interested, inasmuch as all are liable through inadvertence or some other cause to deposit for mailing a misdirected, unpaid, or unmailable letter; and while it is a well-known fact that the number of letters lost in transit is infinitesimally small, for every failure to deliver a letter within a reasonable time there is at least one doubt expressed as to the efficiency of the service, and oftentimes both sender and addressee are complainants. In such cases the service is only relieved of the responsibility in the matter, from their point of view, when the letter which can not be forwarded is placed in the hands of the sender for correction in address or for postage.

It is believed that the prompt return of "nixies" could be insured if each writer would see to it that his name and address is *written, stamped, or printed* in the upper left-hand corner, or on the end of the envelope, so as not to interfere with the letter's address. While it would, of course, be impossible to communicate this information to each and every correspondent in the land, I am of the opinion that if the substance of the suggestion contained in the above paragraph were printed on a slide label to be attached to all post-office and street mailing boxes, where it would undoubtedly attract notice, much good would be accomplished, and the Department as well as the public would be benefited thereby.

CASE EXAMINATIONS.

In reference to the case examinations of permanent clerks covered by table "H^h," hereto appended, it appears that 8,959 examinations were held in the several divisions of the service during the year, at which 10,936,679 cards were distributed by those under examination. Of this number 10,296,073, or 94.11 per cent., were correctly cased. The increase in the number of examinations over the aggregate of last year was 3,909, and 11.4 per cent. in the average number of cards handled at each examination.

Table Iⁱ, which embodies a statement of the case examinations of probationary clerks, shows that 7,125 examinations of these clerks were held during the fiscal year ended June 30, 1890, being an increase of 5.3 per cent. over the number held during the preceding year. Of the number of cards handled at these examinations, namely, 6,861,471, 84 per cent. were correctly distributed, being a better showing by 3.65 per cent. than that of last year. Combining the figures contained in the two tables referred to above, it is ascertained that the aggregate num-

ber of cards handled by both permanent and probationary clerks was 17,798,150, of which 16,059,814, or 90.24 per cent., were correctly distributed.

As the result of a case examination of a postal clerk is a criterion of his efficiency as a distributor, I append hereto a comparative statement of the examinations held during the past six years, which is presumptive evidence of the fact that the result of the work done during the fiscal year ended June 30, 1890, is far in advance of the result accomplished during the five years preceding the 1st of July, 1889.

Under the rules and regulations of the service the postal clerk, in making the distribution of mail, must attach to each package of letters he makes up a slip label bearing the address of the package, the office or route upon which it was made up, together with the name of the clerk making the distribution. All errors are noted upon this label by the clerk who receives and opens the package at destination, and it is then forwarded to the division superintendent, who causes the error to be charged against the clerk's record. This system is an excellent one, if faithfully observed, but for several years past, as has been noted in the annual reports of the service, there has been growing evidence of a disposition on the part of certain clerks to combine and check no errors against friends on connecting lines. Extraordinary efforts have been made during the fiscal year to put a stop to this evil, with a view not only of raising the standard of efficiency of those engaged in the distribution of the mails by rendering closer application to the study of schemes necessary, but also with the object of obtaining absolutely accurate figures upon which to base calculations as to the correctness of the distribution throughout the service, and it is evident from the figures contained in the tabular statement hereto appended that the efforts made in this direction have met with satisfactory results, and have served to establish a standard of accuracy in the practical workings of the railway post-office system which will serve as a criterion from which to judge the work to be accomplished in succeeding years.

CASUALTIES.

During the fiscal year under review, 261 accidents to railway post-office trains have been reported to this office, as shown by the detailed statement hereto appended, in which 4 postal clerks were killed, 41 were severely and 53 slightly injured. Of the number severely injured several have been so badly crippled as to render their retirement from the service necessary at the expiration of the year allowed by the postal regulations, in such cases, to enable the injured clerk to recover and resume service. In order to keep up the runs of injured men, acting railway postal clerks were employed, as shown by the detailed statement appended to this report. The sum of \$7,966.41 was paid such acting clerks employed in place of regular clerks who were injured during the fiscal year ended June 30, 1890. Acting clerks had also to be provided for 35 postal clerks who were injured in 1888-89 and not able to resume service at the commencement of the new fiscal year; the amount paid these acting clerks was \$9,154.69, the total amount paid on this account being \$17,121.10.

PROVISION IN CASE OF DEATH.

I beg at this point to renew the recommendation made in the annual report from this office one year since, that the Postmaster-General be authorized to use the fund arising from deductions because of the failure of clerks in the Railway Mail Service to perform duty in paying to the widows and minor children of railway postal clerks killed while on duty a sum equal to one year's salary of the grade in which the clerk belonged; provided, however, that the heirs of only such as have been in the Railway Mail Service for three consecutive years shall become entitled to such compensation; and provided further, that the maximum sum to be so paid shall not exceed \$1,000. In the event of there not being a sufficient amount arising from deductions the Department shall be authorized to make up the deficiency from the regular appropriation for the payment of railway postal clerks.

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FAST-MAIL SYSTEM.

It can not be otherwise than interesting at this point to contemplate the extent in part of the fast-mail service which has developed so gradually as a portion of the national railway post-office system.

The mileage of the service referred to is as follows:

	Miles.
New York, N. Y., and San Francisco, Cal., via Buffalo, Chicago, Omaha, and Ogden.....	3,355
Boston, Mass., and Port Tampa, Fla., via New York, Washington, Wilmington, and Jacksonville.....	1,568
New York and Denver, Colo., via Pittsburgh, St. Louis, and Kansas City.....	1,990
Green River, Wyo., and Portland, Oregon, via the Oregon Short Line Railroad	976
Chicago, Ill., and New Orleans, La., via the Illinois Central Railroad.....	920
Pittsburgh, Pa., and Cincinnati, Ohio, via Columbus, Ohio.....	313
Kansas City and Council Bluffs, Ia., via Kansas City, St. Jo and Council Bluffs Railroads.....	196
Boston, Mass., and Albany, N. Y., via the Boston and Albany Railroad.....	203
Chicago, Ill., and Minneapolis, Minn., via the Chicago, Milwaukee and St. Paul Railroad.....	423
Washington, D. C., and New Orleans, La., via Charlotte, Atlanta, and Montgomery.....	1,145
* * * * *	

RECAPITULATION.

	Miles.
Full R. P. O. cars (new).....	2,915
Full R. P. O. cars improved, etc.....	11,439
Apartment cars (new).....	3,211
Apartment cars improved, etc.....	4,737
Total for 1890.....	22,302
Total for 1889.....	6,910
Grand total.....	29,212
* * * * *	

AWARDING MEDALS.

Out of a fund created by contributions made by officers and chief clerks of the fifth and sixth divisions last year gold medals of appropriate design were purchased and awarded to the clerks of those divisions of the Railway Mail Service who arrived at the highest standard of perfection in their examinations, and at the close of the year 1890 twelve more gold medals will be awarded in accordance with the following circular notice.

General Order No. 302.

POST-OFFICE DEPARTMENT,
OFFICE OF GENERAL SUPERINTENDENT RAILWAY MAIL SERVICE,
Washington, D. C., February 6, 1890.

I have much pleasure in announcing to the railway postal clerks throughout the entire Railway Mail Service that the honorable Postmaster-General has decided, at the close of this year (1890), to present twelve gold medals to the clerks in the Railway Mail Service.

They will be known as "The Postmaster-General Medals," one of which will be awarded to the clerk in each of the eleven divisions who shall, during the year 1890, have made the best general record on the largest number of cards, representing post-offices, distributed by routes or by counties, modified by the class of the clerk, the number of separations, the cards per minute cased correctly, the error slip record and the car work of the clerk.

The twelfth medal will be awarded to the clerk of any class in any division who shall, during the year correctly distribute in the shortest time and with the largest number of separations cards representing the greatest number of post-offices. In awarding this medal special consideration will be given the rapidity with which the distribution has been accomplished.

The examinations will be conducted in accordance with the general rules adopted at the convention of superintendents in September, 1889, and approved by this office.

There must be no duplication of the cards handled; as, for example, the number of offices in a section or sections of a State cannot be added to an examination on the whole State. Local schemes will not be taken into account, nor will a State be counted by both routes and counties. The reading test will be considered in the clerks general record, but must not be included in the case examinations.

Committees to determine the award of the division medals will be selected by the clerks in their respective divisions in a manner to be arranged by the division superintendent, and a committee to award the twelfth medal will be designated by the General Superintendent.

J. LOWRIE BELL,
General Superintendent.

ESTIMATE FOR RAILWAY POST-OFFICE CLERKS.

As previously stated in the text of this report, there were 5,448 clerks in the service on July 1, 1889, and on July 1, 1890, there were 5,836, being an increase of 388, or 7.1 per cent. The amount paid for salaries during the former period was \$5,250,838.45, and during the latter \$5,590,150.08. The amount appropriated for salaries for the fiscal year ended June 30, 1890, was \$5,600,000, and the expenditures, as above, amounted to \$5,590,150.08, leaving an unexpended balance of \$3,849.92. The annual rate of expenditures for salaries of the clerks in the service at the beginning of the current fiscal year (July 1, 1890) was \$5,818,655, and the appropriation for the fiscal year is \$5,910,000, leaving a margin of but \$91,345 for new service, extension to lines, additional help on lines where the mails are getting heavier, and the promotion of clerks who were serving as probationers at the beginning of the fiscal year. This balance is entirely too small to meet the actual needs of the service during the current fiscal year, and at the very beginning of the year it was found necessary to suspend action for at least six months of the year in the matter of the establishment of new railway post-office lines and extensions of old ones, for the reason that the available balance, as above, is barely sufficient to provide for the requisite number of clerks on lines which have been authorized but which can not be put into operation until about the close of the first half of the year, to avoid the creation of a deficiency.

In this connection it may not be out of place to explain how the available balance at the commencement of the fiscal year came to be so greatly reduced, and I beg to state that the annual count of the books

of this office made June 30, 1888, showed that there were 5,094 clerks in the service whose annual salaries aggregated \$5,084,517, being an average per clerk of \$998.14. On account of the large number of probationers appointed during the months of March, April, and May, 1889, in place of clerks of the higher grades, the average annual rate per clerk had dropped to \$967.11, a difference of \$31.03 per clerk.

During the year under review these new men had completed their probationary terms and been advanced to the grades to which their services and the regulations of this service entitled them, thereby causing the average pay per clerk to increase to be about what it was on the 30th of June, 1888, or, to be more exact, the records of the count of the books of this office made on June 30, 1890, show that the average pay per clerk per annum was on that date \$997.03, being an increase over the average for the previous year of \$30.92. As there were 5,448 clerks in the service on June 30, 1889, it is therefore apparent that the sum of of \$168,451.86 of the estimated increase for new service, etc., for the year ended June 30, 1890, namely, \$310,000, was used in restoring salaries to the average amount existing at the commencement of the previous fiscal year, leaving a balance of but \$141,548.14 to meet the natural increase during 1890-'91, which proves to be inadequate.

The following table exhibits the amount of expenditures and the per cent. of increase, by quarters, during the period from January 1, 1888, to September 30, 1890:

Quarter ending—	Expenditures.	Increase.	
		Amount.	Per cent.
March 31, 1888.....	\$1,254,111.01	\$21,145.39	1.72
June 30, 1888.....	1,274,294.78	20,183.77	1.61
September 30, 1888.....	1,290,590.68	16,304.90	1.28
December 31, 1888.....	1,311,370.13	20,779.45	1.61
March 31, 1889.....	1,327,185.09	15,806.56	1.21
June 30, 1889.....	1,321,673.05	*5,511.74	*0.42
September 30, 1889.....	1,336,025.20	14,352.15	1.09
December 31, 1889.....	1,385,788.07	49,762.87	3.73
March 31, 1890.....	1,417,577.39	31,789.32	2.30
June 30, 1890.....	1,450,759.42	33,182.03	2.34
September 30, 1890.....	1,459,164.59	8,405.17	0.58
Net increase.....			17.05

* Decrease.

ESTIMATE FOR RAILWAY POST-OFFICE CARS.

The amount appropriated for railway post-office car service, exclusive of the gross amount accrued to Pacific roads for the fiscal year ended June 30, 1890, was \$2,260,000; amount expended, \$2,207,151.01, leaving an unexpended balance of \$52,848.99.

During the fiscal year several new lines of railway post-office cars were authorized, but in view of the fact that the cars were not completed and placed in service prior to June 30, 1890, no charge was made against the appropriation for last year on account of the same.

By adding to the above expenditure of \$2,207,151.01 the amount accrued to Pacific roads, namely, \$241,405.75, we find the total cost for railway post-offices for the year to have been \$2,448,556.76, being an increase of \$315,843.65, or 14.8 per cent., over the amount of cost for the fiscal year ended June 30, 1889.

The growth of this branch of the service from July 1, 1881, to June 30, 1890, is shown in the subjoined table:

Fiscal year ended June 30—	Amount of appropriation.	Amount expended.	Expenditures.		Per cent.		Total amount accrued in Pacific roads.
			Increase.	Decrease.	Increase.	Decrease.	
1881.....	\$1,366,600.00	\$1,368,221.50	\$126,676.31	.....	11.00	.....	\$150,241.75
1882.....	1,426,000.00	1,317,242.23	49,929.73	.....	3.60	.....	124,879.46
1883.....	1,526,000.00	1,483,080.85	166,844.62	.....	12.50	.....	133,696.17
1884.....	1,575,000.00	1,546,597.29	192,510.44	.....	8.80	.....	130,730.26
1885.....	1,625,000.00	1,716,437.13	130,830.84	.....	8.23	.....	124,311.80
1886.....	1,705,026.00	1,692,628.30	.....	24,411.83	.....	1.42	120,871.40
1887.....	1,808,000.00	1,713,391.92	21,804.62	.....	1.20	.....	120,371.21
1888.....	1,934,500.00	2,822,964.37	169,572.45	.....	6.38	.....	128,292.02
1889.....	2,053,643.08	1,991,066.61	168,102.24	.....	9.22	.....	141,648.80
1890.....	2,260,000.00	2,207,161.01	216,084.40	.....	10.61	.....	241,486.73

Increase, 60.35 per cent.; decrease, 1.42 per cent.; net increase, 57.93 per cent.; average per cent. per year, 7.55.

As the amount earned by the subsidized Pacific railroads and branches, on account of the use by this service of railway post-office cars belonging to their lines, is not paid from this appropriation, in making the estimate for the ensuing fiscal year the amounts accrued to those lines are not taken into consideration. Without these amounts the average annual increase for the past eight years (exclusive of 1886) is 7.55 per cent. As stated in the last annual report, the figures for 1886 were excluded for the reason that the apparent decrease in that year was owing entirely to the discontinuance by the Department of payment for cars less than 40 feet in length.

The annual rate of cost of railway post-office car lines (exclusive of the amounts to be credited to the subsidized Pacific roads) on July 1, 1890, was \$2,311,968.86. Including lines authorized previous to the close of the fiscal year, and which had not been put into operation prior to July 1, 1890, additional lines aggregating in cost \$230,816.90 have been authorized up to this date (October 14, 1890). For the current fiscal year new lines and the extension of old ones costing \$113,972 per annum have been urgently recommended by division superintendents. If these are authorized the annual rate of cost on July 1, 1891, will be \$2,667,757.76. With the extent of full railway post-office service that will be covered by this annual rate of \$2,667,757.76 on July 1, 1891, it is believed the additional lines to be provided for in 1891-'92 should not exceed in annual cost \$63,275, which amount, added to the annual rate on July 1, 1891, will make the amount needed for the coming fiscal year \$2,731,032.76, being an increase of \$221,032.76, or 8.8 per cent., over the amount appropriated for the current fiscal year.

I have, therefore, the honor to recommend that the sum of \$2,731,000 be appropriated for railway post-office car lines, exclusive of lines on the subsidized Pacific roads, for the fiscal year ending June 30, 1892.

ESTIMATE FOR SPECIAL FACILITIES.

The amount appropriated under this heading for the current fiscal year is \$293,421.79. It is believed that the growth of the ordinary mail service, with its attending increase in compensation, has reached an extent justifying a gradual withdrawal from all lines of special facility compensation, and it is with a view to the carrying out of this method, which has already received your approval, that I recommend a reduction in the amount to be appropriated for special facilities on trunk lines for the fiscal year ending June 30, 1892, to \$197,103.50.

COMMENDATION.

During the past year perfect harmony has governed throughout the service, and there prevails, on the part of the division officers and clerks, an interest in its advancement far greater than has ever before existed.

The clerks appreciate the important fact that advancement depends upon their individual efforts to merit promotion, and the desirable clerks are becoming more and more determined to establish a higher standard of efficiency.

I have the honor to be, very respectfully,

JAMES E. WHITE,
General Superintendent.

Hon. J. LOWRIE BELL,
Second Assistant Postmaster-General.

Recapitulation of casualties in the Railway Mail Service from 1875 to 1890.

Year ended June 30—	Total number of clerks.	Number of casualties.	Clerks killed.	Clerks seriously injured.	Clerks slightly injured.
1875	2, 238	(*)	1	(*)	(*)
1876	2, 415	(*)	1	(*)	(*)
1877	2, 500	27	2	10	4
1878	2, 608	36	2	15	3
1879	2, 609	35	8	14	13
1880	2, 946	26	.....	14	15
1881	3, 177	62	7	15	22
1882	3, 570	83	3	16	20
1883	3, 885	114	1	85	42
1884	3, 963	154	7	24	60
1885	4, 387	102	2	35	65
1886	4, 573	211	.....	56	60
1887	4, 851	244	5	45	72
1888	5, 094	248	4	63	45
1889	5, 448	193	10	95	40
1890	5, 836	261	4	41	53

* Not reported.

REPORT OF THE THIRD ASSISTANT POSTMASTER-GENERAL.

POST-OFFICE DEPARTMENT,
OFFICE OF THE THIRD ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., October 30, 1890.

SIR: I have the honor to submit the following report, with accompanying papers, showing the operations of this office during the fiscal year ending June 30, 1890:

FISCAL YEAR ENDING JUNE 30, 1890.

REVENUE.

1. Ordinary postal revenue:
 - (a) Letter postage paid in money..... \$108, 725. 41
 - (b) Box-rents..... 2, 257, 505. 70
 - (c) Fines and penalties..... 6, 810, 26
 - (d) Postage-stamps, stamped envelopes, newspaper wrappers, and postal-cards..... 57, 651, 724. 58

REVENUE—continued.

1. Ordinary postal revenue—continued.	
(c) Dead letters.....	\$12,310.73
(f) Miscellaneous	20,801.00
Total ordinary postal revenue.....	\$69,067,857.08
2. Receipts from money-order business.....	224,228.24
Gross revenue.....	69,892,085.32
Less amount charged to bad debts, compromise, and suspense cases.	21,314.32
Leaves as total net revenue.....	69,853,781.00

EXPENDITURES AND LIABILITIES.

Expenditures:	
Amount expended from July 1, 1889, to September 30, 1890	\$65,930,717.11
Liabilities:	
1. Estimated amount of unpaid indebtedness for various objects remaining on September 30, 1890, on account of the service of the year	\$305,096.39
2. Estimated amount of indebtedness not yet reported to Auditor by the Department on account of the transportation of the mails by railroad..	76,512.40
3. Amount chargeable for transportation on the non-aided lines of the Central Pacific Railroad Company, not certified to the Secretary of the Treasury under decision of the Supreme Court and remaining unpaid for want of appropriation	320,529.07
4. Amount chargeable for mail transportation on Sioux City and Pacific Railroad, not included in the amount certified to the Secretary of the Treasury, and payment for which is suspended by the Treasury Department	12,228.83
	714,366.69
Total amount of expenditures and liabilities for the service of the year	66,645,083.80
Leaves deficiency in postal revenue....	5,786,300.40

COST OF POSTAL SERVICE FOR 1890.

The estimated total cost of the service for the year ending June 30, 1890, including amount certified to the Secretary of the Treasury for transportation of the mails on the Pacific railroads and not chargeable to the appropriations, will appear as follows:

Amount of expenditures and estimated liabilities as shown in the foregoing statement.....	\$66,645,083.80
Amount certified to the Secretary of the Treasury for credit to the Pacific railroad companies for mail transportation.....	1,207,401.80
Gives total estimated cost of service	67,852,485.60
Deduct amount of net revenue, as above.....	69,853,781.00
Leaves excess of cost of the postal service over amount of postal revenue for year ending June 30, 1890	6,991,702.20

As compared to the year ending June 30, 1889, there was an increase of \$68,926.72, or 3.1 per cent., in box-rents; and of \$1,698,622.75, or 3.8 per cent., in the amount received from the sale of postage-stamps,

stamped envelopes, newspaper wrappers, and postal-cards, making a total of \$4,767,549.47. There was a decrease of \$67,886.87, or 38.4 per cent., in letter postage paid in money; of \$13,089.94, or 65.7 per cent., in the amount received from fines and penalties; of \$411.65, or 3.2 per cent., in the income from dead letters; and of \$16,089.70, or 43.6 per cent., in miscellaneous receipts, making a total of \$97,478.16, and leaving the net increase \$4,670,071.31, or 8.4 per cent., over the postal revenue for 1889. The receipts from money-order business showed an increase of \$36,415.43, or 4.6 per cent., as compared with the business of the previous year.

The gross revenue of the year, \$60,882,007.92, was reduced in the sum of \$23,314.52 through the adjustment of bad debts, compromise, and suspense accounts, leaving the total revenue \$60,858,783.40. This was an increase of \$4,710,768.48, or 8.37 per cent., over the net revenue for the year ending June 30, 1889, as against an increase of 6.7 per cent. for the year ending June 30, 1889, over the preceding year. The increase of expenditures and estimated liabilities was \$4,089,636.02, or 5.5 per cent., over those of the previous year. The increase of revenue was \$621,132.46 more than the increase of expenditures for the year. The increase in the estimated total cost of the service, including amount certified to the Secretary of the Treasury for transportation of the mails on the Pacific railroads, was \$4,042,786.36, or 6.3 per cent., over that of the year ending June 30, 1889. The estimated deficiency of revenue needed from the Treasury to meet the expenditures and liabilities was \$5,786,300.40, being equal to 8.6 per cent. of the total expenditures and estimated liabilities for the year. As compared to the previous year, the deficiency of revenue to be supplied from the Treasury was reduced in the sum of \$621,132.46, to correspond with the excess in the increase of revenue over that of expenditures. The total cost of the service, including amount certified on account of the Pacific railroads, was \$6,993,702.20, or 11.4 per cent., in excess of the total revenue.

The appropriations for the service of the year amounted to \$67,326,959.37, including \$141,502.26 for the special-delivery system, for which no specific amount is appropriated, the expenses of the system being payable out of its receipts. The appropriations covered forty-one items, including that for special-delivery service. The total amount expended up to the 30th September on account of the year ending June 30, 1890, was \$65,930,717.11. In thirty-nine items of appropriation there were unexpended balances remaining on the 30th September to the amount of \$1,549,337.95. In one item, that of compensation to postmasters, the expenditure exceeded the appropriation in the sum of \$153,095.69. The net amount of unexpended balances was, therefore, \$1,396,242.26, which is left available for the discharge of indebtedness on account of the respective items for which appropriation was made.

By quarters the expenditures of the fiscal year ending June 30, 1890, as compared with those for the corresponding periods of the previous fiscal year, were as follows: For the service of the quarter ending September 30, 1889, \$15,992,321.71, being an increase of \$1,282,105.88, or 8.7 per cent.; for service of the quarter ending December 31, 1889, \$16,544,890.20, being an increase of \$1,311,866.10, or 8.6 per cent.; for the service of the quarter ending March 31, 1890, \$16,737,515.30, being an increase of \$1,017,531.28, or 6.4 per cent.; and for the service of the quarter ending June 30, 1890, \$16,655,989.90, being an increase of \$942,366.61, or 6 per cent.

Among the principal items of expenditure for the year, there was an increase as follows over the same items for the year ending June 30,

1889: Of \$584,104.70, or 4.4 per cent., for compensation to postmasters; of \$596,641.54, or 10 per cent., for compensation to clerks in post-offices; of \$185,252.13, or 22.8 per cent., for rent, fuel, and light in post-offices; of \$1,017,915.51, or 14.6 per cent., for free-delivery service; of \$143,536.94, or 2.7 per cent., for transportation on star routes; of \$1,243,916.87, or 6.9 per cent., for inland transportation by railroad; of \$16,456.66, or 3.8 per cent., for steamboat transportation; of \$212,084.40, or 10.6 per cent., for railway postal-car service; of \$47,913.67, or 5.1 per cent., for mail-messenger service; and of \$328,777.26, or 6.2 per cent., for railway post-office clerks.

ESTIMATES FOR THE FISCAL YEARS ENDING JUNE 30, 1891 AND 1892.

FISCAL YEAR ENDING JUNE 30, 1891.

Amount of ordinary postal revenue for year ending June 30, 1890....	\$60,057,877.68
Increase by 10 per cent.....	6,005,787.76
Estimated amount of ordinary postal revenue.....	66,463,665.44
Add revenue from money-order business, upon revised estimates of the superintendent of the money-order system, by letter of October 27, 1890.....	835,000.00
Gives gross revenue.....	67,298,665.44

The total amount appropriated for the expenditures of the year is \$72,226,698.99, and this amount will without doubt be sufficient to cover the expenditures, and leave a handsome amount of unexpended balance besides.

Upon the foregoing basis the deficiency of revenue to be supplied out of the general Treasury will not exceed \$5,581,615.19.

FISCAL YEAR ENDING JUNE 30, 1892.

Estimated amount of ordinary postal revenue for year ending June 30, 1891, as before.....	\$66,463,665.44
Add increase of 10 per cent.....	6,646,366.54
Gives estimated amount of ordinary postal revenue for the year.....	73,110,031.98
Amount of estimated revenue from money-order business.....	845,000.00
Gross revenue for the year.....	73,955,031.98
Amount of estimated expenditures shown in table of estimates submitted by the Postmaster-General through the Secretary of the Treasury.....	77,545,804.41
Leaves estimated deficiency of revenue to be supplied out of general Treasury.....	3,590,862.43

DEAD-LETTER FUND.

The money taken from dead letters for which no owners could be found, and that realized from the auction sale of unclaimed articles accumulated in the Dead-Letter Office, which was turned over to the finance division, aggregated \$12,050.51

This money was disposed of as follows, viz :

Amount received.....	\$12,050.51
Amount in current funds deposited in the Treasury at Washington, D. C.....	\$11,825.00

Amount realized from sale of foreign and uncurrent funds by the postmaster at New York and deposited with the assistant treasurer at New York.....	\$186. 28
Total amount deposited.....	12, 011. 28
Amount of loss sustained from sale of uncurrent funds, from counterfeits and from mutilated minor coin.....	39. 23
	<u>\$12, 050. 51</u>

SPECIAL-DELIVERY SYSTEM.

The following statement shows briefly the operations of the special-delivery system during the year ending June 30, 1890:

(1) The total number of pieces of mail-matter received for special delivery at all the letter-carrier or free-delivery offices was 1,613,567, of which 1,229,939, or 76 per cent., were transmitted through the mails from place to place, and 383,628, or about 24 per cent., were local or drop-letters.

(2) The total number of pieces delivered by special-delivery messengers at letter-carrier offices was 1,537,221, or over 95 per cent. of all the special-delivery pieces received, leaving 76,346, or less than 5 per cent. as the number delivered by letter-carriers or other salaried postal employés, including such pieces as it was found impossible to deliver.

(3) The value of the special-delivery stamps on matter received for delivery at letter-carrier offices was \$161,356.70. The amount of special-delivery stamps sold during the year at the same offices was \$133,737.70.

(4) The average number of special-delivery messengers employed at the letter-carrier offices was 901.

(5) The average time consumed at letter-carrier offices in the delivery of special-delivery matter, after it reached the respective offices of destination, was twenty-one minutes.

From the foregoing statistics and from the report of the Sixth Auditor, the following statement is made up, showing the amount of special-delivery business transacted throughout the whole country:

Total number of special-delivery letters delivered.....	1, 769, 528
Percentage of increase over number delivered during preceding year....	9. 2
Amount of special-delivery stamps on matter received for delivery.....	\$176, 952. 80
Total amount paid messengers.....	141, 562. 26
Total profit to the Government on special-delivery business.....	35, 390. 54

In Table No. 16, attached to this report, will be found statistics in detail of special-delivery matter received and delivered at all letter-carrier offices during the year; as to other offices, statistics in detail can not be given.

I have the honor to be, very respectfully, your obedient servant,

A. D. HAZEN,

Third Assistant Postmaster-General.

Hon. JOHN WANAMAKER,
Postmaster-General.

REPORT OF THE SUPERINTENDENT OF THE POSTAL MONEY-ORDER SYSTEM.

POST-OFFICE DEPARTMENT, OFFICE OF SUPERINTENDENT OF MONEY-ORDER SYSTEM,

Washington, D. C., November 7, 1890.

SIR: I have the honor to submit herewith the twenty-sixth annual report of the operations of the Postal Money-Order System of the United States, the same being for the fiscal year ended June 30, 1890.

Table A, annexed hereto, shows the number of post-offices authorized to issue and to pay domestic money-orders, the amount of such orders issued, paid, and repaid, the amount of fees received therefor, and the attendant expenses, as reported by the Auditor, year by year, from the inauguration of the system to the 30th of June last.

NUMBER OF MONEY-ORDER OFFICES.

The number of money-order offices in operation June 30, 1889, was 8,727. During the year ended June 30, 1890, the domestic money-order business was put into operation at 674 additional offices, and was discontinued at 19 offices at which it was no longer required, so that at the close of the last fiscal year the total number of money-order offices in operation was 9,382. Since June 30, 1890, 460 names have been added to the list of offices authorized to transact domestic money-order business, while at 6 other offices that business has been discontinued, leaving 9,836 offices authorized to issue and to pay domestic money-orders and postal notes at the present time.

NUMBER OF OFFICES AUTHORIZED TO ISSUE, BUT NOT TO PAY, POSTAL NOTES.

At the close of the year ended June 30, 1889, there were in operation 557 small offices authorized under the act of Congress approved January 3, 1887, to issue postal notes, but not to pay them. Additional offices of this kind (known as "postal-note offices") to the number of 223 were made during the past year, while 52 were discontinued as such, leaving 728 in operation on June 30, 1890. Of the number mentioned as discontinued, however, 36, by reason of their growth and the demand for additional facilities thereat, were made money-order offices, and in this category authorized to issue and to pay postal notes as well as money-orders. To the number of "postal note offices," 80 have been added since June 30, 1890. The names of 121 such offices since that date have been transferred to the list of money-order offices, while from 10 others the privilege of issuing postal notes has been withdrawn, leaving the whole number of "postal-note offices" at present in operation 677.

ISSUES AND PAYMENTS OF DOMESTIC MONEY-ORDERS.

The number of domestic money-orders issued during the year was
10,624,727, aggregating in amount..... \$114,362,757.12
The number of such orders paid during the same
period was 10,514,548, of the value of..... \$113,513,300.06

And the number repaid 82,060, amounting to.....	\$834, 331. 29
Making the total amount of payments and repayments.....	\$114, 347, 631. 35
And the excess of issues over payments and repayments.....	15, 125. 77
The gross amount of the fees received by postmasters from the public for the issue of domestic money-orders was.....	\$950, 755. 57

The above, compared with the like transactions for the preceding year shows:

(1) An increase of 494,587, or 4.88 per cent., in the number of orders issued; of 462,639, or 4.60 per cent., in the number of orders paid, and of 5,426, or 7.08 per cent., in the number of orders repaid.

(2) A decrease of \$719,088.67, or 0.62 per cent., in the amount of orders issued; of \$934,568.84, or 0.81 per cent., in the amount of orders paid, and an increase of \$293.25, or 0.03 per cent., in the amount of orders repaid.

(3) An increase of \$17,148.07, or 1.83 per cent., in the gross amount of fees received.

The average amount of the orders issued was \$10.76, or 60 cents less than the average amount of the orders issued in the previous year.

The average fee received was 8.94 cents, being 0.28 of a cent less than the average fee received in 1888-'89.

ISSUES AND PAYMENTS OF POSTAL NOTES.

The number of postal notes issued during the year was 6,927,825, of the total value of.....	\$12, 160, 489. 60
And the number of notes paid during the same time was 6,831,206, amounting to.....	\$12, 063, 005. 09
While the number repaid at the offices of issue was 34,705, aggregating in amount.....	65, 569. 35
	12, 128, 574. 44

The excess in the amount of issues over payments and repayments being.....	31, 915. 16
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The gross amount of fees received from the public (including fees received for duplicates of invalid notes) was.....	\$208, 123. 23
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A comparison of the above with the statement for the previous year shows:

(1) An increase of 125,105, or 1.83 per cent., in the number of postal notes issued; of 124,100, or 1.85 per cent., in the number of notes paid; and a decrease of 45,643, or 56.80 per cent., in the number repaid at the offices of issue.

(2) An increase of \$78,298.87, or 0.64 per cent., in the amount of postal notes issued; of \$137,346.83, or 1.15 per cent., in the amount of notes paid; and a decrease of \$86,850.09, or 56.98 per cent., in the amount of notes repaid.

(3) An increase of \$3,745.41, or 1.83 per cent., in the gross amount of fees received.

The average amount of the postal notes issued was \$1.75, or 3 cents less than the average amount of the notes issued the preceding year.

* * * * *

LOST REMITTANCES.

The Assistant Attorney-General for the Post-Office Department reports that seventy-two cases of alleged loss, in transit by mail, of money-order funds were disposed of during the past fiscal year, pursuant to

the provisions of the act of Congress approved March 17, 1882, by which the Postmaster-General is empowered to allow credit for losses of this nature incurred without fault or negligence on the part of the postmaster. In thirty of these cases the postmasters were allowed credit for the amounts, aggregating \$2,635; in twenty-four cases, the total amount of which was \$2,195, the claims were disallowed; and in eighteen cases, wherein the amounts named aggregated \$710, the applications for allowance were withdrawn or dismissed, it having been ascertained, after the filing of the claims, that no loss had actually occurred.

I am, sir, very respectfully, your obedient servant,

C. F. MACDONALD,

Superintendent of the Money-Order System.

Hon. JOHN WANAMAKER,

Postmaster-General.

REPORT OF THE SUPERINTENDENT OF FOREIGN MAILS.

POST OFFICE DEPARTMENT,

OFFICE OF FOREIGN MAILS,

Washington, D. C., November 5, 1890.

SIR: I have the honor to submit the following report of the principal operations in connection with the foreign mail service during the fiscal year ended June 30, 1890.

From Table (A) immediately following, showing the weights of the mails dispatched by sea to foreign countries, and the percentage dispatched to each of the countries named therein, it will be seen that the aggregate weights of said mails were:

	Grams.	Pounds.
Letters and post cards	327,020,401=	721,080
Other articles	1,636,731,639=3,	602,993
Total		4,330,073

Of which the mails for transatlantic destinations comprised:

	Grams.	Pounds.	Per cent.
Letters and post cards	292,649,410=	645,292	(82.49)
Other articles	1,194,356,584=2,	633,556	(72.97)
Total		3,278,848	

And that of the transatlantic mails, the mails for Great Britain, consisted of

	Grams.	Pounds.	Per cent.
Letters and post cards	126,696,437=	279,145	(43.96)
Other articles	596,789,902=1,	313,022	(49.17)
Total		1,595,067	

The mails for Germany:

	Grams.	Pounds.	Per cent.
Letters and post cards	59,820,027=	131,903	(20.44)
Other articles	242,688,027=	535,127	(20.32)
Total		667,030	

The mails for France:

	Grams.	Pounds.	Per cent.
Letters and post cards	20,001,405=	44,110	(6.81)
Other articles	97,902,261=	215,874	(2.10)
Total		259,984	

with each of which countries there is direct steam-ship communication, leaving as the weights of the mails for all other transatlantic destinations—

	Grams.	Pounds.	Per cent.
Letters and post cards.....	86, 228, 481	=190, 134	(29. 46)
Other articles.....	256, 976, 374	=566, 633	(21. 52)
Total.....		756, 767	
* * * * *			

COST OF THE SERVICE.

The sums reported for payment on account of the sea transportation of the mails dispatched to and received from foreign countries during the fiscal year, including the amounts credited in the general postal accounts to foreign governments for the conveyance of United States mails by steamers subsidized by said governments, as follows, viz:

To France, for services of steamers of the General Transatlantic Line from New York to Havre.....	\$25, 442. 94
To Belgium, for services of steamers of the Red Star Line from New York and Philadelphia to Antwerp.....	19. 95
To the Netherlands, for services of steamers of the Netherlands Steam Navigation Company from New York to Amsterdam and Rotterdam....	3. 24
To the Bahamas, for services of steamers of the New York and Cuba Mail Steamship Company from New York to Nassau, N. P.....	554. 34
And also paid to the Panama Railway Company for transporting by railway, from Colon to Panama, the United States mails for the West Coast of Central and South America.....	11, 113. 39
Amounted to \$551, 790. 44, distributed as follows:	
Transatlantic service.....	397, 669. 40
Transpacific:	
Vessels of United States register.....	\$61, 049. 50
Vessels of foreign register.....	9, 039. 16
	70, 088. 66
Miscellaneous service (Canada, Mexico, Central and South America, and the West India Islands):	
Vessels of United States register.....	\$59, 120. 09
Vessels of foreign register.....	13, 798. 90
	72, 918. 99
The Panama Railway Company.....	11, 113. 39
	\$551, 790. 44
* * * * *	

SEA POST-OFFICES.

Attention having been directed to the advantages to accrue in point of expediting the dispatch and delivery of correspondence by adopting the practice of distributing the mails for and from foreign countries on board the conveying steamers while in transit, correspondence has been had with the postal administrations of Great Britain, Germany, and France, looking to the establishment of international sea post-offices on the principal lines of transatlantic steamers; and in continuation of the correspondence, Mr. William Potter, of the city of Philadelphia, was authorized to present the subject, in personal interviews, to the Postmaster-General of Great Britain and the Directors-General of posts of Germany and France. The result is that, while the postal administrations of Great Britain and France have declined to enter into the arrangement, for the reason that no material advantage would inure in those countries, because the mails are distributed in railway post-offices between the ports of landing and the offices of London and Paris, respectively, the German postal administration has entered heartily into

the scheme, and negotiations relative to the details of the arrangement are now pending, which give promise of seeing the service inaugurated at an early day on the steamers plying between New York and Bremen and Hamburg, via Southampton. Mr. Potter is entitled to the thanks of the Department for his successful efforts in bringing about this great improvement in the service, he having neither asked nor received any compensation whatever, not even to the amount of his actual and necessary traveling expenses.

The authority for inaugurating the service and a sum estimated as necessary to defray its cost are provided in "An act making appropriations for the service of the Post-Office Department for the fiscal year ending June 30, 1891."

N. M. BROOKS,

Acting Superintendent of Foreign Mails.

THE POSTMASTER-GENERAL.

REPORT OF THE SUPERINTENDENT OF THE DEAD-LETTER OFFICE.

POST-OFFICE DEPARTMENT,
DEAD-LETTER OFFICE.

Washington, D. C., October 20, 1890.

I have the honor to submit herewith annual report of the business of the Dead-Letter Office for the fiscal year ended June 30, 1890, embracing statements and exhibits tabulated in forms showing in detail the operations and work of the office covering the period named.

There were received during the year 6,517,556 pieces of original dead mail matter, an increase of 310,663 pieces, or a little more than 5 per cent. over the number received during the fiscal year ended June 30, 1889. In addition to this number there were also received 167,900 letters without valuable inclosures which had been returned to the writers, but, failing of delivery, were again sent to the Dead-Letter Office. These, together with 193 "held-for-postage" letters, and 8,970 letters of foreign origin on hand and undisposed of on July 1, 1889, make the total number of pieces treated during the year 6,694,962, which were classified, treated, and disposed of as follows:

1. Domestic mailable letters:

(a) Ordinary unclaimed letters.....	4,906,912	
(b) Letters returned from hotels.....	153,749	
(c) Letters bearing fictitious addresses.....	49,717	
(d) Letters returned from foreign countries.....	196,350	
(e) Ordinary letters without inclosures sent to writers and returned on failure to deliver.....	167,900	
		<hr/> 5,465,628

2. Domestic unmailable letters:

(a) Letters containing unmailable articles.....	1,045	
(b) Letters held for postage.....	28,154	
(c) Letters misdirected or only partially addressed.....	451,289	
(d) Letters without address.....	23,329	
(e) Miscellaneous.....	3,489	
		<hr/> 577,127

3. Domestic parcels of third and fourth class matter.....

74,561

4. Letters mailed in foreign countries.....

512,282

5. Printed matter, samples, etc., mailed in foreign countries and returnable.....

41,483

6. Registered articles :

(a) Of domestic origin.....	5,442	
(b) Of foreign origin	18,430	
		<u>23,872</u>

Total, as before 6,694,962

The mail matter treated during the year was disposed of as follows:

Domestic mailable letters:

Card and request letters delivered unopened.....	79,538	
Letters opened (disposed of as detailed below).....	5,218,190	
Ordinary letters without valuable inclosures sent to writers and returned on account of failure to deliver and subsequently destroyed.....	167,900	

Domestic unmailable letters:

Held-for-postage letters forwarded unopened to addresses on receipt of postage.....	3,961	
Held-for-postage letters forwarded to officials unopened	329	
Held-for-postage letters returned to card address.....	1,031	
Held-for-postage letters opened (disposed of as below).....	92,546	
Held-for-postage letters on hand at close of year.....	287	
Misdirected letters forwarded unopened after correction of address....	97,896	
Misdirected letters returned to card address.....	1,014	
Misdirected letters opened (disposed of as below).....	352,379	
Letters without address opened (disposed of as below).....	23,359	
Letters containing unmailable articles opened (disposed of as below).....	1,045	
Miscellaneous unmailable letters opened (disposed of as below).....	3,290	

Domestic third and fourth-class matter:

Parcels opened and disposed of as below	74,561	
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Foreign matter:

Letters returned to country of origin or delivered to addresses	508,757	
Letters on hand at close of year	3,526	
Parcels of printed matter, samples, etc., returned unopened or delivered to addresses	41,481	
		<u>553,764</u>

Registered articles:

Domestic—

Of domestic origin, delivered unopened.....	2,963	
Of domestic origin, opened.....	2,479	
		<u>5,442</u>

Foreign—

Returned to country of origin or delivered to addresses.....	17,921	
On hand at close of year	509	
		<u>18,430</u>

Total..... 6,694,962

The following was the disposition of mail matter opened in the Dead Letter Office:

Delivered:

Letters containing money.....	17,008	
Letters containing drafts, money-orders, notes, etc.....	23,779	
Letters containing postal-notes.....	3,440	
Letters containing miscellaneous papers, etc	34,534	
Letters containing postage-stamps.....	152,179	
Letters containing nothing of value.....	1,458,483	
Photographs.....	34,856	
Parcels of merchandise, books, etc.....	26,039	
		<u>1,750,318</u>

Returned to owners and awaiting evidence of delivery:

Letters containing money.....	1,431	
Letters containing drafts, notes, etc.....	950	
Letters containing postal-notes.....	280	
		<u>2,661</u>

Under treatment, looking to delivery:

Letters containing money.....	2,408	
Letters containing drafts, money-orders, notes, etc.....	834	
Letters containing postal-notes.....	17	
Letters containing miscellaneous papers, etc.....	153	
Letters containing postage-stamps.....	668	

Under treatment looking to delivery—Continued.

Letters containing nothing of value.....	906,491	
Photographs.....	124	
Parcels of merchandise, books, etc.....	202	910,897
Filed upon failure to deliver, subject to reclamation:		
Letters containing money.....	7,651	
Letters containing drafts, notes, etc.....	1,000	
Letters containing postal-notes.....	291	
Letters containing miscellaneous papers, etc.....	13,778	
Letters containing postage-stamps.....	4,980	
Photographs.....	7,151	
Parcels of merchandise, books, etc.....	37,423	
Unmailable letters.....	1,515	
Destroyed:		
Letters without inclosures, which could not be returned to writers.....	3,734,871	73,849
Parcels containing pamphlets, fruit, seeds, medicines, etc..	10,304	
Letters containing postage-stamps.....	3,971	
		3,755,296
Grand total.....		6,702,931

FOREIGN DEAD MAIL MATTER.

Returned to country of origin:		
Registered articles.....	17,587	
Ordinary letters.....	503,531	
Parcels of printed matter, samples, etc.....	38,206	559,394
Delivered to addressees on application:		
Registered articles.....	200	
Ordinary letters.....	323	
Parcels of printed matter, samples, etc.....	631	1,153
Misdirected matter forwarded to corrected addresses:		
Registered articles.....	134	
Ordinary letters.....	4,994	
Parcels of printed matter, samples, etc.....	2,584	7,692
On hand under treatment at close of year:		
Registered articles.....	500	
Ordinary letters.....	3,526	4,026
Total.....		579,194

MATTER RETURNED FROM FOREIGN COUNTRIES.

The number of pieces of mail-matter originating in the United States and returned to Dead Letter Office as undeliverable were classified as follows:

Registered articles.....	1,613
Ordinary letters (including postal-cards).....	204,977
Parcels of printed matter, samples, etc.....	45,153
Total.....	251,643

DEAD REGISTERED MATTER.

Of the 5,442 unclaimed registered letters and parcels received there were—

Delivered to addressees or restored to senders.....	4,028
Returned to postmasters for delivery and awaiting receipt.....	169
Filed upon failure to discover ownership and awaiting reclamation.....	1,246
Total.....	5,442

VALUE OF INCLOSURES IN MAIL MATTER RESTORED TO OWNERS.

The following table shows the number of letters restored to owners or in course of restoration, with the character and value of contents:

Description.	Number.	Value.
Letters containing money restored to owners.....	16, 779	\$28, 429. 31
Letters containing money outstanding in the hands of postmasters for restoration to owners.....	1, 431	4, 199. 53
Number of letters containing drafts, checks, notes, money-orders, etc., restored to owners.....	23, 779	1, 349, 713. 96
Number of letters containing drafts, checks, notes, money-orders, etc., outstanding in the hands of postmasters for restoration to owners.....	950	21, 857. 73
Number of letters containing postal-notes restored to owners.....	3, 440	5, 329. 91
Number of letters containing postal-notes outstanding in the hands of postmasters for restoration to owners.....	280	454. 58

REVENUE DERIVED FROM DEAD MAIL MATTER.

The amount of revenue derived from dead mail matter during the year and delivered to the Third Assistant Postmaster-General for deposit in the Treasury is shown by the following statement:

Amount separated from dead letters that could not be restored to owners..	\$0, 283. 98
Amount realized from auction sale in December, 1899, of parcels of merchandise which could not be restored to owners.....	2, 766. 53
Total.....	12, 050. 51
* * * * *	*

DEAD MATTER GIVEN TO CHARITABLE INSTITUTIONS.

During the year 17,673 magazines, illustrated papers, picture cards, etc., which could not be restored to the owners, were distributed among the inmates of the various hospitals, asylums, and other charitable institutions in the District of Columbia, as heretofore, by order of the Postmaster-General.

The following shows the number and character of the matter distributed:

Magazines.....	1, 856
Pamphlets.....	4, 808
Illustrated papers.....	4, 609
Picture cards, valentines, etc.....	6, 400
Total.....	17, 673
* * * * *	*

D. P. LEIBHARDT,
Superintendent.

Hon. JOHN WANAMAKER,
Postmaster-General.

REPORT OF THE AUDITOR OF THE TREASURY FOR THE
POST-OFFICE DEPARTMENT.OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT.

Washington, D. C., October 20, 1890.

SIR: I have the honor to submit herewith the annual report of receipts and expenditures of the Post-Office Department, as shown by the accounts of this office, for the fiscal year ended June 30, 1890. All expenditures on account of service of last and prior fiscal years are stated to September 30, 1890, as in former reports.

REVENUE ACCOUNT OF THE POST-OFFICE DEPARTMENT.

Service of the fiscal year 1890.

Postal revenues of the year ended June 30, 1890.....	\$60,882,187.32
Expenditures to September 30, 1890.....	65,930,717.11
Excess of expenditures over all revenues.....	5,048,529.79
Amount placed with the Treasurer to the credit of the Department, being grants from the general Treasury in aid of the postal revenue under section 2 of the act approved March 2, 1889. (Statutes, vol. 25, chapter 374, page 845).....	4,500,000.00
Excess of expenditures over grants.....	548,529.79
Amount of balances due from late postmasters closed by—	
Suspense.....	\$1,884.41
Bad debts.....	10,589.37
Compromise debts.....	10,840.74
Net loss by suspense, bad, and compromise debts.....	22,314.52
Amount to be placed with the Treasurer.....	571,933.71

Service of the fiscal year 1889.

Amount placed with the Treasurer to the credit of the Department, being grants from the general Treasury in aid of the postal revenues under section 2 of the act approved July 24, 1888. (Statutes, vol. 25, chapter 702, page 347).....	1,500,000.00
Amount to be placed with the Treasurer of the United States, as shown by the report for the fiscal year 1889.....	\$728,832.32
Expended from October 1, 1889, to September 30, 1890....	268,495.15
	967,317.47
Balance available on account of the fiscal year 1889.....	532,682.83

Service of the fiscal year 1888.

Balance available September 30, 1889.....	\$109,920.30
Amount placed with the Treasurer to the credit of the Department, being grant from the general Treasury in aid of the postal revenues under section 2 of the act approved March 3, 1887. (Statutes, vol. 24, chapter 388, page 570).....	100,000.00
	\$209,920.30
Expended from October 1, 1889, to September 30, 1890.....	38,823.47
Balance to be placed in the general Treasury.....	171,106.83

NOTE.—By virtue of joint resolution, public No. 28, approved July 2, 1890, \$28,432.07 of the above balance (\$171,106.83), unexpended for the service of the fiscal year 1888, is available until June 30, 1891, for the payment of claims of letter-carriers for compensation for extra time in the months of May and June, 1888, made under the provisions of an act entitled "An act to limit the hours that letter-carriers in cities shall be employed per day. Approved May 24, 1888."

REPORT OF THE POSTMASTER-GENERAL.

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Service of the fiscal year 1887.

Balance unexpended October 1, 1889, certified to the general Treasury, report 503, warrant No. 2921, Washington, dated January 9, 1890	\$324,963.09
Compensation of postmasters and late postmasters re-adjusted and allowed under act March 3, 1883:	
Amount available October 1, 1889	21,420.65
Expended from October 1, 1889, to September 30, 1890	16,197.69
Balance unexpended September 30, 1890	5,222.96

GENERAL REVENUE ACCOUNT.

Postal revenues for the year ended June 30, 1890	60,882,097.92
Expenditures for the service of 1890	\$65,930,717.11
Expenditures for the service of 1889	268,485.15
Expenditures for the service of 1888	38,823.47
Expenditures for the service of 1882 and prior years (claim of Gardner B. Hubbard)	5,324.42
Expenditures for the service of 1886 and prior years for salaries of postmasters and late postmasters re-adjusted under act March 3, 1883	16,197.69
Total expenditures to September 30, 1890	66,259,547.84
Excess of expenditures over revenue	5,377,449.92
Amount due from late postmasters on accounts closed by suspense	1,884.41
Amount due from late postmasters on accounts closed by bad and compromise debts	21,430.11
Net loss by suspense, bad debts, and compromise debts	23,314.52
Excess of expenditures	5,400,764.44
Grants from the general Treasury:	
Under act of March 3, 1887	100,000.00
Under act of July 24, 1888	1,500,000.00
Under act of March 2, 1889	4,500,000.00
Total grants	6,100,000.00
Excess of grants over expenditures	699,235.56
Amount of grant to the general Treasury to repay, of the postal deficiency appropriation for 1887, the sum drawn in excess of actual deficiency (paid to the Treasurer by warrant No. 2921, dated January 9, 1890)	324,963.09
Net excess of grants over expenditures	374,272.47
The balance standing to the credit of the general revenue account September 30, 1889	3,161,543.21
Balance standing to the credit of the general revenue account September 30, 1890	3,535,815.68
Of which there was due by late postmasters, in suit	309,332.78

POSTMASTERS' QUARTERLY ACCOUNTS CURRENT.

The net revenues of the Department from postages, being aggregate revenues at post-offices for the fiscal year, less the compensation of postmasters and clerks and the contingent office expenses, were:

For the quarter ended—	
September 30, 1889	\$9,538,954.40
December 31, 1889	10,183,011.21
March 31, 1890	10,217,921.87
June 30, 1890	9,502,311.11
Total	38,442,198.59

The number of quarterly returns of postmasters received and audited, on which the above sum was found due the United States, was:

For the quarter ended—

September 30, 1889.....	59, 929
December 31, 1889.....	69, 140
March 31, 1890.....	61, 280
June 30, 1890.....	62, 285
Total.....	252, 634

STAMPS SOLD.

The amount of stamps, stamped envelopes, newspaper-wrappers, letter-sheets and postal-cards sold was:

For the quarter ended—

September 30, 1889.....	\$13, 086, 494. 33
December 31, 1889.....	14, 951, 721. 61
March 31, 1890.....	15, 167, 827. 10
June 30, 1890.....	14, 405, 679. 64
Total.....	57, 651, 724. 58

LETTER POSTAGE.

The amount of postage paid in money was..... \$103, 731. 32

Included in the above amount are the following sums paid by foreign countries in the adjustment of their accounts:

Great Britain and Ireland.....	\$51, 109. 88
Japan.....	1, 559. 21
Canada.....	28, 736. 54
Spain.....	12, 381. 90
Venezuela.....	859. 90
Mexico.....	6, 135. 31
Switzerland.....	680. 20
Hawaii.....	1, 700. 00
New South Wales.....	426. 51
Bahama.....	290. 13
Queensland.....	75. 67
Victoria.....	309. 07
Jamaica.....	1, 010. 57
Nicaragua.....	148. 55
	105, 493. 44
Balance collected by postmasters.....	3, 237. 88

The following balances were paid and charged to the appropriations for balances due foreign countries:

Service of 1890:

Germany.....	\$18, 581. 47
International Bureau.....	638. 79
Italy.....	8, 480. 29
Belgium.....	11, 864. 91
Denmark.....	12, 448. 80
Norway.....	561. 28
Sweden.....	3, 346. 45
The Netherlands.....	1, 235. 19
Newfoundland.....	2, 131. 70
Bulgaria.....	549. 86

Total for 1890..... \$59, 904. 73

Service of 1889:

France	\$13,000.00	
Austria	1,785.95	
Total for 1889.....		\$14,785.95
Aggregate amount paid.....		74,690.69

MAIL TRANSPORTATION.

The amount charged to "transportation accrued" and placed to the credit of mail contractors and others for mail transportation during the fiscal year was:

For the regular supply of mail routes.....	\$29,377,984.77	
For the supply of special offices.....	42,840.13	
For the supply of mail-messenger offices	970,016.60	
For the salaries of railway postal clerks.....	5,571,323.54	
For the salaries and expenses of the superintendents of the railway-mail service	74,538.15	
Total		36,036,703.19

FOREIGN MAIL TRANSPORTATION.

New York, Great Britain, and Ireland, and countries beyond, via Great Britain.....	\$198,357.47	
New York, Great Britain, and Germany, and countries beyond	207,001.49	
Philadelphia, Great Britain, and Ireland .....	.60	
New York, Norway.....	1.26	
Boston, Great Britain, and Ireland	1,449.48	
New York, Baltimore, Philadelphia, Boston, Key West, New Orleans, and San Francisco, West Indies, Central and South America, Mexico, etc.....	81,452.63	
Boston, Nova Scotia	1,213.26	
Upper Pacific coast.....	606.25	
San Francisco, China, Japan, Farther India, Australia, and South Sea Islands.....	70,088.66	

Total foreign mail	560,171.10
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Total transportation accrued.....	36,596,874.29	
The amount credited to "transportation accrued" and charged to mail contractors for overcredits, being for fines and deductions, was	309,538.95	
The amount of fines and deductions remitted was	22,566.79	

Net amount of fines and deductions.....	286,972.16
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Net amount of "transportation accrued".....	36,309,902.13	
The amount paid during the year was	34,049,085.48	

Excess of "transportation accrued"	2,260,816.65
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PACIFIC RAILROAD SERVICE.

Included in the above amount of "transportation accrued" are the following balances for the transportation of the mails over Pacific railroads, which have been certified to the Register of the Treasury; the amount is not charged to the appropriation for "inland transportation railroads," and is not, therefore, included in the total of transportation paid:

Regular service, 1890—

Union Pacific Railway Company (old Union Pacific Railway line) aided.....	\$422,625.56	
Union Pacific Railway Company (old Kansas Pacific line) aided.....	68,003.71	

Regular service, 1890—Continued.

Lines operated, leased, or controlled by the Union Pacific Railway Company, non-aided	\$250,042.09	
Central Pacific Railway Company, aided	365,829.05	
Sioux City and Pacific Railway Company, aided...	9,450.50	
		\$1,055,963.92

Use of postal cars, 1890—

Union Pacific Railway Company (old Union Pacific Railway line) aided	53,006.25	
Union Pacific Railway Company (old Kansas Pacific line) aided	9,850.00	
Lines operated, leased, or controlled by the Union Pacific Railway Company, non-aided	7,803.09	
Central Pacific, aided	45,618.85	
Sioux City and Pacific Railway Company, aided..	1,204.51	
		151,472.79

Regular service, 1889—

Union Pacific Railway Company (old Union Pacific Railway line) aided	168.76	
Union Pacific Railway Company (old Kansas Pacific line) non-aided	409.37	
		578.13

1,208,614.65

Amounts previously reported "certified to the Register of the Treasury" charged back by order of the Secretary of the Treasury. (See letter of June 20, 1890.)

Regular service, 1890: Central Pacific Railway Company, aided. 34.77

STATEMENT OF PAYMENTS TO AND COLLECTIONS FROM LATE POSTMASTERS.

Amount collected during the year from late postmasters ..	\$56,211.14	
Amount charged to suspense	5,129.27	
Amount charged to bad and compromise debts	21,716.23	
		\$113,056.64
Amount paid during the year to late postmasters	116,507.97	
Amount credited to suspense	4,045.01	
Amount credited to bad and compromise debts	286.12	
		120,839.10
Amount remaining due postmasters becoming late during the fiscal year ended June 30, 1890		69,387.34

STATEMENT OF POSTAL ACCOUNTS OF LATE POSTMASTERS IN SUIT ON JUNE 30, 1890.

Amount of postal accounts of late postmasters in suit on June 30, 1889	\$297,396.27	
Amount of postal accounts of late postmasters submitted for suit during fiscal year ended June 30, 1890 ..	27,494.74	
		\$324,891.01
Amount of postal accounts of late postmasters collected during the fiscal year ended June 30, 1890	2,055.22	
Amount of postal accounts of late postmasters otherwise settled during fiscal year ended June 30, 1890	12,600.01	
		14,655.23
Balance of postal accounts of late postmasters remaining in suit on June 30, 1890		309,235.78
Amount of interest and costs collected in suits against late postmasters and sureties on postal accounts during the fiscal year ended June 30, 1890		1,332.34

Very respectfully,

T. B. COULTER,

Auditor.

Hon. JOHN WANAMAKER,
Postmaster-General.

REPORT
OF THE
SECRETARY OF AGRICULTURE.

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., October 25, 1890.

To the PRESIDENT:

I have the honor to submit my Second Annual Report as Secretary of Agriculture.

I deem it to be my first duty in making this report to congratulate you and the country at large upon the generally improved outlook in agricultural matters. At no time in the history of this country has there been so much agitation among the farmers as a class as during the period which has elapsed since I had the honor to submit to you my first report. The causes of this widespread agitation have been so varied and so numerous that to attempt to specify them all would be as tedious as it would be unnecessary in a report of this character. I will only refer to such of the most prominent causes as for various reasons seem to require special mention here.

Naturally the first place in this brief enumeration belongs to a depressed condition of agriculture prevailing at the time that you assumed office, the result of a slight but steady diminution of the prices of most of our staple agricultural products, a reduction which had been going on for some years, and which, therefore, has amounted in the aggregate to a considerable percentage of the average crop values. Severely as such a depression must necessarily have been felt by a class who measure even their prosperity by a very moderate standard of profit, it has not been without its good results.

The attention of the country was thoroughly awakened to the farmer's condition, and agricultural matters were very properly made the subject of special consideration by Congress. The subject was dis-

cussed in the press, the views of the farmers themselves were made known, and it is gratifying to be able to point out that to-day the cloud which for some years seemed to rest gloomily upon American agriculture has been lightened, while the wise economic legislation already secured holds out still brighter promise for the future. As an earnest of this statement, I subjoin a brief table, showing prices of some of our staple agricultural products to-day and a year ago.

Prices of leading agricultural products at Chicago, October 15.

Articles.		1893.	1890.
Corn.....	per bushel.....	\$0.20 to \$0.21	\$0.20 to \$0.20
Wheat.....	do.....	.80 to .81	1.00 to 1.01
Oats.....	do.....	.18 to .19	.42 to .43
Barley.....	do.....	.60	.75
Flaxseed.....	do.....	1.27 to 1.28	1.45 to 1.46
Stock wheat.....	do.....	.50 to .51	.55 to .56
Hogs.....	per 100 pounds.....	3.42 to 4.20	3.45 to 4.30
Cotton, choice.....	do.....	4.00 to 5.05	4.75 to 5.25
Sheep, Western.....	do.....	2.50 to 4.25	2.80 to 4.40

The recent legislation looking to the restoration of the bimetallic standard of our currency, and the consequent enhancement of the value of silver, has unquestionably had much to do with the recent advance in the price of cereals. The same cause has advanced the price of wheat in Russia and India, and in the same degree reduced their power of competition. English gold was formerly exchanged for cheap silver, and wheat purchased with the cheaper metal was sold in Great Britain for gold. Much of this advantage is lost by the appreciation of silver in those countries. It is reasonable, therefore, to expect much higher prices for wheat than have been received in recent years.

In my last report I ventured to appeal most earnestly for a larger measure of tariff protection for the farming industry. "For all such articles as our own soil will produce, the farmer justly asks that protection which will insure to him all the benefits of our home market." Such was the language with which I concluded my appeal on his behalf. I am thankful to say that it has been in a very large measure heeded; and, admitting to the fullest extent the place to which natural causes are entitled in assigning reasons for the higher prices now prevailing for agricultural products, it is impossible not to see the beneficial influence of the tariff protection awarded to the farmer under the present law. A comparison of the duties under the present law on some of the agricultural products heretofore imported in considerable amounts with the rates of duty imposed on them under the old law will illustrate this in a striking manner.

Agricultural imports, fiscal year ending June 30, 1890, with change in tariff duties.

	Value.	Old duty.	New duty.
Animals and animal products:			
Cattle	\$245,067	20 per cent. ad val...	{Over one year, \$10. Under one year, \$2.
Horses	4,840,165	20 per cent. ad val...	{ \$30, or 30 per cent. if value over \$150.
Sheep	1,268,209	20 per cent. ad val...	{Over one year, \$1.50. Under one year, \$0.75.
Cheese	1,295,506	4c. per lb.	6c. per lb.
Eggs	2,074,912	Free	5c. per dozen.
Wools	15,264,083		
Class 1 (above and below 30c. per lb.)		10c. and 12c.	11 cents.
Class 2 (above and below 30c. per lb.)		10c. and 12c.	12 cents.
Class 3 (above and below 12c. per lb.)		2½c. and 5c.	{At 13c. per lb., 32 p. ct. Over 13c., 50 p. c. ad val.
Flax	2,188,021		
Straw		\$5 per ton	\$5 per ton.
Not hickled		\$20 per ton	1c. per lb.
Dressed line		\$40 per ton	8c. per lb.
Tow		\$10 per ton	1½c. per lb.
Barley	5,629,849	10c. per bush.	30c. per bush.
Hay	1,143,445	\$3 per ton	\$4 per ton.
Hops	1,053,616	8c. per lb.	15c. per lb.
Tobacco	17,605,663		
Unstemmed (leaf)		75c. per lb.	\$2 per lb.
Stemmed (leaf)		\$1 per lb.	\$2.75 per lb.
All other		35c. per lb.	{Stemmed, 50c. per lb. Unstemmed, 35c. per lb.
Potatoes	1,345,896	15c. per bush.	25c. per bush.
Wines	8,959,972		
Champagne:			
Bottles between pint and quart		\$7 per doz.	\$8 per doz.
Bottles between half pint and pint.		\$3.50 per doz.	\$4 per doz.
Bottles less than half pint.		\$1.75 per doz.	\$2 per doz.

We have a strong assurance in the recent increase of values of meat products, and the circumstances which now environ production, of continued prosperity of stock raising. New industries now in process of development will increase the ability of consumers to purchase meats; and better protection of wool will open larger domestic markets, as it has already advanced prices. There is an increasing interest in the production of mutton in the central West, and of early lambs in the populous East, indications of progress that promise increase of profit in sheep husbandry. Of chief interest naturally to the stock raisers of this country are the export trade in animals and their products, and the possibilities of still further relieving our home markets of these products by extending our markets abroad.

THE EXPORT TRADE IN ANIMALS AND THEIR PRODUCTS.

Step by step as it were with the vigorous prosecution of the work of exterminating pleuro-pneumonia and controlling Texas fever, and with a more general appreciation of the benefits derived from a judicious exercise of the powers conferred on this Department, we find a gratifying improvement in the export trade in live animals. The total value of animals and fowls exported for the fiscal year ending June 30, 1890, was over \$33,000,000, an increase of something over \$15,000,000 as compared with the year previous. The increase in the number of cattle was from 205,786 in 1889 to 394,836 in 1890, while the number of hogsexported increased from 45,000 to 91,000, over 100 per cent. In

horses there was a slight reduction of exports, far more than counter-balanced, however, by the large increase in the number of mules exported. In the number of sheep exported there was a decrease.

A very large increase is shown in the export trade in beef and hog products, while in dairy products the export trade in butter was especially gratifying, the figures for 1889 being 15,504,978, and in 1890 29,748,042. The increase in the value of meat and dairy products exported between 1889 and 1890 was over \$34,000,000. At a time when our domestic markets are overcrowded with animals and their products, this increase in the export trade is very encouraging. The prices realized abroad have as a rule been good, and but for the unjust restrictions placed upon both animal and meat products abroad, the increase in the amount exported would have been much greater. Experimental shipments of cattle to Germany and Belgium were made during the year with favorable results, but excessive duties and the quarantine restrictions which were immediately imposed at once destroyed this trade. A careful review of the trade shows how urgent it is that we should secure more favorable regulations in the chief European countries in regard to our exports of animals and animal products. The first step towards the accomplishment of this object was necessarily to secure as far as possible the absolute immunity of our own cattle from disease.

ERADICATION OF PLEURO-PNEUMONIA.

The regulations for the eradication of contagious pleuro-pneumonia have been vigorously enforced during the entire year, and rapid progress has been made. In New York no cases have occurred during the year ending June 30, 1890, except on Long Island. There have been no cases in Maryland since October, 1889. Pennsylvania has remained free from the disease during the entire year. In both Maryland and Pennsylvania constant inspection has been maintained and the complete eradication of the contagion thereby assured. During the two months of May and June, 1890, but 13 affected animals were purchased in the whole infected district as compared with an average of 71½ per month during the preceding ten months. At this writing it would seem that the disease is practically banished from American soil, though the length of time which has elapsed since the last case of the disease was noted by the inspectors has been hardly sufficient to warrant a formal official declaration to this effect.

INSPECTION IN GREAT BRITAIN.

The vigor with which the work of exterminating pleuro-pneumonia was carried on would nevertheless, as far as our export trade was concerned, have been comparatively ineffectual unless simultaneously with its eradication in this country we were able to convince Great Britain and other European Governments of the progress made in ridding the

United States of this disease. Early last winter, therefore, I solicited the aid of the State Department in opening negotiations through Minister Lincoln with the British Government, looking to an arrangement which I deemed extremely desirable with a view to putting an end to the frequent allegations that cases of contagious pleuro-pneumonia existed among American cattle shipped to British ports.

The circumstances under which these allegations were made convinced me of the absolute necessity that this department should be represented at the inspections made of our cattle on landing in Great Britain. Thanks to the cordial co-operation of the State Department and the intelligent activity displayed in the matter by Minister Lincoln, I finally obtained the privilege of appointing veterinary inspectors representing this department, to be resident in Great Britain, who were to be allowed every facility in participating with the British inspecting officers in the work of inspecting American cattle landed in British ports. As soon as this privilege was secured I appointed three competent officers for this responsible duty and dispatched them to Great Britain in charge of the Chief of the Bureau of Animal Industry, Dr. Salmon, who remained with them until their duties were clearly defined and the best means decided upon to enable them to carry on their work effectually and in harmony with the British authorities. This transatlantic inspection has been in force for the past two months, and I am happy to be able to state that since it was instituted not a single case has been reported of contagious pleuro-pneumonia among American cattle landed in Great Britain. Indeed, I am now informed that not a single case has been reported by the British authorities themselves since March last.

At the same time that I presented this matter to the attention of the Secretary of State I also placed before him facts bearing upon our meat export trade, showing conclusively the utterly groundless nature of the charges made by other European Governments in regard to the unwholesomeness of our meat but especially of our pork products. I am happy to state that this matter was taken up by the State Department with the same cordiality that characterized its action in regard to our export of live cattle, and that the facts supplied by me to that Department were laid before the foreign governments by our respective ministers so clearly and with such force as will, I am sure, carry considerable weight in the further consideration of this subject by the governments in question.

INSPECTION OF EXPORTED ANIMALS.

The act of August 30, 1890, provides for the inspection of all exported cattle, sheep, and swine. The amount of work required to accomplish this is indicated by the fact that during the year ending June 30, 1890, the number of these animals exported was as follows: Cattle, 394,836 head; hogs, 91,148 head; sheep, 67,521 head. Rules and reg-

ulations for this service have been prepared and the inspection is now being made. The necessity of this inspection is shown by the exclusion of American cattle, sheep, and swine from European markets on the plea of the danger that disease will be introduced by them. While this inspection alone might not be accepted as in all cases giving a complete guaranty against the appearance of disease during the voyage, it is an important step in this direction and will give us the means of knowing officially the condition of the animals as they leave our ports. In connection with the inspection recently established by me at the foreign animal wharves of Great Britain, it will also enable us to trace back animals which may be found affected there, so that the nature of their malady may be determined, and if found contagious the proper measures will be enforced for its eradication.

REGULATIONS REGARDING TEXAS FEVER.

The regulations regarding Texas fever, which went into effect on March 15, though carefully formulated so as to allow the free movement of Southern cattle to market, have been on the whole well observed, and the result has been a marked decrease in the number of cases of Texas fever occurring on farms, in stock yards, or on vessels carrying export cattle. One of the largest buyers and exporters of cattle in the United States reports that, whereas a year ago he dared not buy cattle for feeding or export in the stock yards, but was obliged to go to the farms where he could get evidence that they had not been exposed, this year, on the contrary, he has purchased such animals at the stock yards without fear. Last year his losses from Texas fever, in spite of his precautions in buying, were considerable; the present summer he has not lost one from this cause. He further states that, owing to the immunity from this disease, insurance rates have been reduced from \$8 to \$3.50 on every \$100 worth of cattle, this alone representing a saving of over a million dollars on export cattle. Owing to lack of authority under existing laws, I have, however, been unable in some cases to enforce these regulations, and there is at present no penalty which can be applied in such cases. Owing to such disregard, some cases have occurred of Texas fever imparted to valuable thoroughbred cattle, which have since died from the effects of the disease.

Proper facilities for separating the two classes of cattle are still lacking at the ports on the Atlantic seaboard, and as a consequence the disease has occasionally appeared among export cattle on their voyage to foreign countries. The influence of this upon the trade is very bad. It is being cited in Great Britain as affording good reason for their continuing the prohibition of the introduction of live cattle from this country. Ample power to compel immediate remedy of this condition of things is therefore urgently needed. If the regulations of this Department can be properly enforced, the appearance of Texas fever in this country outside of the affected area will be very rare,

and not a single case should occur among cattle after leaving our ports. I have therefore suggested amendments to the act establishing the Bureau of Animal Industry, which are now pending in Congress. If enacted, these will fully provide for the prevention of the spread of this and other communicable diseases of animals from State to State or from the United States to foreign countries. These amendments are essential to rendering the work of this Department effectual. If there is to be control of animal diseases at all, it must be so thorough as to prevent their spread, and thus remove foreign objections to our cattle and meats, give confidence to stock owners and shippers, and secure full protection to farmers.

INSPECTION OF PORK PRODUCTS.

It is with great gratification that I have assumed the duties imposed upon me by the passage of the act of August 30, 1890, in which provision is made for the inspection of salted pork and bacon. The unjust war waged upon our pork products by some of the European governments rendered this provision absolutely necessary as a preliminary step towards any action looking to a removal of the obstacles which now impede our export trade in these products. The absence of inspection on this side provoked an argument on the part of the representatives of foreign governments, to which we were really not prepared to reply. It was that no inspection being held by ourselves, while a rigid inspection was conducted by them of American pork products landed in their countries, they were in a position to know better than we ourselves the actual condition of these products. The present law will enable us to warrant the wholesomeness of our pork products under the seal of official inspection. Having then satisfactorily established the injustice of these foreign discriminations, we shall be in a position to demand their withdrawal, or at least to insist upon a retraction of all charges made on the ground of unwholesomeness or impurity. Armed with a certificate of inspection guaranteeing wholesomeness on the one hand, and with the retaliatory clause wisely interpolated in this law on the other, we shall, it seems to me, be in a position to provide powerful support to further diplomatic negotiations on behalf of American hog products.

MEAT INSPECTION.

In my report of last year I urged the great desirability of a national inspection of cattle at the time of slaughter, and also an inspection of meats, which would enable this Department to guarantee that the animal products exported from this country were untainted by disease, and which would reveal at once the presence of any diseases affecting our meat-producing animals. The call for such inspection was not because of any unusual prevalence of disease, since the animals of the United States are probably at present more exempt from such influences

than those of any other nation, but because of the unfounded statements of disease which have been made the pretense for the restrictions and prohibitions which the governments of other countries have enforced against our animals and their products. Some of these restrictions upon the sale of our meats have been removed, and it appears from the statements of shippers, confirmed in some cases by the reports of our consular agents, that there is a tendency to make them more stringent and irksome. It is sufficiently evident that any assistance which the Government can properly render to such trade, at a time when our home markets are overstocked as at present, should be freely accorded.

A bill providing for a general inspection law of this character was passed by the Senate September 18, 1890, and has been referred to the Committee on Commerce of the House of Representatives. This bill provides for all necessary regulations, and if passed will enable the Secretary of Agriculture to cause the inspection of animals and meats at slaughter, and to give a guaranty of their wholesomeness and freedom from taint of every kind. Such a law is urgently needed and should be enacted without delay.

QUARANTINE AND INSPECTION OF IMPORTED CATTLE.

Regulations for the quarantine of neat cattle from the countries not located on the American continent continue to be enforced. The period of quarantine—three months—is regarded as amply sufficient under the regulations to prevent the introduction of disease; and no additional restrictions will be imposed, notwithstanding the fact of the restrictions imposed by Great Britain on cattle from this country, and the further fact that pleuro-pneumonia is much more prevalent and widely spread in Great Britain than it ever was here.

There has long been danger of the introduction of foot-and-mouth disease by the importation of sheep, swine, and other susceptible animals that have heretofore been allowed to land without either quarantine or inspection; indeed, this disease has several times been brought to this country by cattle from Great Britain, but it has fortunately been detected in time to prevent its dissemination here. Notwithstanding this fact our sheep have been excluded from Great Britain for more than ten years, owing to the alleged existence of this disease in the United States, where it is never seen except in British cattle that were affected before landing.

I have concluded that the adoption by this Department of regulations for quarantine and inspection of all neat cattle, sheep, and other ruminants, and all swine imported into the United States under the authority given to me by the act of August 30, 1890, is necessary for the full protection of our own live animals. Regulations have accordingly been perfected to carry this provision into effect, and it is believed that the result will be not only to fully protect our herds and flocks, but,

in view of the assurances to that effect secured from the British authorities, that it will moreover result in the revocation by the British Government of the regulation excluding our sheep from Great Britain. This inspection and quarantine of all cattle, sheep, and swine imported into the country, will add seriously to the work of this Department. During the twelve months ending June 30, 1890, cattle were imported to the number of 30,695; sheep to the number of 393,794; but the figures of the Bureau of Statistics of the Treasury Department fail to give the number of swine imported. Increased duties levied under the present law will no doubt greatly diminish the number of animals imported, although during the year just mentioned 3,935 head of cattle and 16,303 head of sheep were admitted duty free, on the ground that they were imported for breeding purposes.

In this connection I would point out that the average value of the 10,865 horses imported for breeding purposes during the year was but \$270 each; that the cattle imported for this purpose averaged but \$18.60, and the sheep but \$7.26, showing conclusively that by far the greater number of these animals were not of such a character as would improve our native stock, and that they could only be sold in competition with the animals produced by our own farmers. The new law provides "that no such animal shall be admitted free unless pure bred of a recognized breed, and duly registered in the book of record established for that breed." This wise provision will no doubt restrict the importation of animals free of duty to those which have special merit and which will prove beneficial to the agricultural interest.

THE SUGAR INDUSTRY.

Encouraging progress has been made within the past year in the development of an indigenous sugar industry. Under the impetus given by the investigations of this Department, improved processes of manufacture have been introduced on many of the more prominent plantations of Louisiana. In Florida large tracts of swamp land suitable for the cultivation of sugar cane have been reclaimed, and the culture and manufacture of cane have already been begun. In Nebraska a large beet-sugar factory, capable of using 300 tons of beets per day, has been erected with the best approved modern machinery, and is now in successful operation. The finest quality of granulated sugar is produced, which finds a ready local market, thus avoiding all expenses of transportation to and from a distant refinery.

A careful study of the soil and climatic conditions of the country favorable to the production of sugar beets has been made, and those localities in the United States best adapted for this purpose have been pointed out. This area includes a zone of territory extending from the Atlantic to the Pacific with a breadth of from 100 to 200 miles. It includes parts of the New England States, Northern New York, Northeastern Pennsylvania, Northern Ohio, Indiana, Illinois, Wis-

consin, Southern Iowa, parts of Nebraska and the Dakotas, and large portions of the Rocky Mountain plateaux and of the Pacific slope. Within these areas it is confidently believed—and this belief has been verified by actual production of good beets—will be found an adequate acreage for the production of sugar on a large scale, and from beets as rich as can be grown in Europe. It is not an idle prophecy to speak of the production of a quantity of beet sugar in the near future sufficient to supply one half or more of all the sugar consumed in the United States.

The investigations in sorghum culture have also been vigorously prosecuted, and the Department will soon be ready to offer to the sorghum growers of the country a few varieties of that plant which have been already developed to a high degree of excellence as sugar producers. At least one sugar factory in Kansas has been operated the present year with profit to the owners, with an output of three quarters of a million pounds of sugar, demonstrating that with the best agriculture, the best soil and climate, and the best machinery, sorghum sugar may be made at a profit.

Under the fostering provisions of the new tariff bill, it is believed that the patient and laborious investigations of the Department will soon bear fruit and result in the production of our sugar at home. To further secure this end I have established three special experimental stations for the scientific study of the problems underlying the promotion of an indigenous sugar industry; one each for sugar cane, sorghum, and the sugar beet. Through these stations the farmers of the country will be taught the principles of the successful growth of the plants producing sugar, and the manufacturer the best methods of securing in marketable shape the products of the fields. With the administrative changes in the tariff law which I recommend, it is my sincere belief that the efforts of this Department to secure home sugar for home consumption will prove successful.

EFFECTS OF RECENT LEGISLATION.

It becomes my duty to call attention in this report to certain provisions under the tariff law which went into effect on the 6th instant, relating to the bounties on sugar from beets, sorghum, or sugar cane grown within the United States. Under Schedule E, paragraph 231, it is provided that the bounty on sugar, according to the polariscopic test, shall be paid "under such rules and regulations as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall prescribe." Paragraph 232 provides that to the same officer, namely, the Commissioner of Internal Revenue, sugar producers shall give due notice as to the place of production, equipment, and an estimate as to the amount of sugar they propose to produce in the current or next ensuing year, and that they shall furthermore apply to the Commissioner of Internal Revenue for a license, accompanied by a bond.

Paragraph 233 provides that the Commissioner of Internal Revenue shall issue such license; Paragraph 234, that no person not so provided with a license, etc., can receive bounty, and that the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, "shall from time to time make all needful rules and regulations for the manufacture of sugar from sorghum, beets, or sugar cane grown within the United States, or from maple sap produced within the United States, and shall, under the direction of the Secretary of the Treasury, exercise supervision and inspection of the manufacture thereof," and so on throughout the entire Schedule E, relating to sugar, does the law provide that the entire regulation and control of sugar making in the United States shall devolve upon a subordinate officer of the Secretary of the Treasury.

It seems impossible that the law should have been so drafted, save by an oversight. The entire work relating to the development of the sugar industry in the United States, from the chemical supervision of sugar making established in Louisiana to the sorghum and beet-sugar experiments throughout the country, has been, from the first, part of the work of the Department of Agriculture, under the special supervision of its chief chemist. Under the direction of this officer there have been issued from time to time bulletins of the utmost importance to both growers and manufacturers. They are, indeed, the only official sources of information relating to this important industry issued by the national government; and during the last session of Congress a special appropriation was made by that body of \$50,000, to be expended through the Chemical Division of this Department under my direction, in promoting the cultivation of sugar-making plants and the manufacture of sugar. Moreover, the very essence of the supervision necessary, with a view to an equitable award of bounties, namely, the testing of the sugar by the polariscope, is a strictly scientific operation, coming within the sphere of the Chemical Division, and one with which a considerable experience has made the chief and his assistants thoroughly familiar.

If it be really the intention of Congress to withdraw the "supervision and inspection" of the sugar industry from this Department, such intention should be formally expressed, and the efforts of this Department in relation to this important matter, involving the expenditure of much time, labor, and money, must be restricted to such lines of labor and investigation in connection with this industry as relate directly and exclusively to the sphere of the tiller of the soil. It is perhaps not generally understood that heretofore all the scientific supervision of work done in the various manufactories of sugar throughout the country has been exercised by the Chemical Division of this Department. Officers of this division have been detailed by me for this purpose, and a number of them are so engaged under my orders at this present time. It is unquestionably due to this Department to re-

ognize the fact that whatever improvement has been made in methods of sugar manufacture, and whatever progress has been accomplished in the development of the sorghum and beet-sugar industry, has been due to the scientific investigations conducted under its auspices and the practical application of the results under the supervision of its officers.

Again, under Free List, paragraph 482 provides that "any animal imported specially for breeding purposes shall be admitted free." It is further provided, in accordance with a suggestion of my own, that no such animals shall be admitted free unless pure bred, of a recognized breed, and duly registered in the book of record established for that breed. The provisions referred to are followed by the statement that "the Secretary of the Treasury may prescribe such additional regulations as may be required for the strict enforcement of this provision." Even before this Department was an executive department of the Government, its Bureau of Animal Industry had supervision of the importation of live animals into this country, and the head of the Department was held responsible in matters of quarantine of live animals, and for the supervision of the live-stock industry and the contagious diseases of animals. Recent legislation enlarges the powers of this Department, lodging in the hands of the Secretary of Agriculture the control of all importations of animals, whether free or dutiable, imposing upon him the duty of inspecting the same, as he is charged also with the duty of regulating the interstate commerce in live animals and the proper inspection of all live animals exported.

Under those circumstances, the provision I have quoted, making it the duty of another officer to prescribe regulations for the enforcement of the provision admitting animals free under certain conditions, is incomprehensible to me. In section 20 of the said law it is provided—

That the operation of this section—

Prohibiting the importation of neat cattle and^e hides of neat cattle from any foreign country—

shall be suspended as to any foreign country or countries or any parts of such country or countries, whenever the Secretary of the Treasury shall officially determine and give public notice thereof, that such importation shall not tend to the introduction or spread of contagious or infectious diseases among the cattle of the United States, and the Secretary of the Treasury is hereby authorized and empowered and it shall be his duty to make all necessary orders and regulations.

Inasmuch as there is no officer of the national government whose duty it is to have authentic information as to the existence of diseases among cattle in foreign countries and as to the contagious or infectious character of such diseases, and the probability of the introduction or spread thereof among the cattle of the United States, save only the Secretary of Agriculture, the provision in question which makes it the duty of another officer to declare officially as to such facts is, to say the least, an instance of glaring inconsistency in the law.

REORGANIZATION.

The act providing the necessary appropriations for carrying on the work of this Department became a law but a few months ago, and until this was done, I was naturally much hampered in my efforts to carry out fully and thoroughly the measures indicated by me in my last report as essential to an efficient reorganization of the Department. During the past winter and spring I was obliged to do the best I could in this direction under these discouraging circumstances.

Since the 14th of July, when the appropriation act became a law, I have, with such appropriations as Congress saw fit to place at my disposal, pushed the work of reorganization with all possible energy. Under that act several new divisions were created, but as the work for these divisions had already been duly considered and carefully outlined, and as the persons designed to take charge of them were already in the employ of the Department, their reorganization was effected, I may say, immediately on the passage of the law.

A review of the work of the several divisions, which I now have the honor to lay before you, indicates the activity and energy with which the work of the Department has been pushed; and with a well-deserved tribute to the intelligence and good will exercised by all the members of my large force, in the performance of the duties assigned to them, I will now call your attention to the most salient features of the work of each division.

BUREAU OF ANIMAL INDUSTRY.

I have already alluded in this report to the exercise of the administrative powers of this Bureau and the generally satisfactory results which have followed, as well as to the additional powers which are in my opinion needed to make the work absolutely efficient.

INVESTIGATION OF DISEASES.

The scientific investigation of the communicable diseases has been carried on for the purpose of elucidating the many points in connection with the cause and nature of these maladies which must be understood before they can be economically prevented or eradicated. The diseases to which most attention has been given are hog cholera and Southern fever of cattle. With both, discoveries of great importance have been made which are not only of value from a scientific point of view, but which promise important results in the way of prevention and treatment, and will accordingly be treated at length in the report of the Bureau of Animal Industry.

A thorough knowledge of animal plagues is becoming more and more necessary, both because of the great increase in the number of animals in the country and the multiplication of the transportation routes by which contagion may be carried, and also because of the recent legis-

lation already mentioned looking to a Government guaranty that the animals shipped abroad and those from which our meat products are obtained have been unaffected by disease. The excellent results which have already been reached with pleuro-pneumonia and Texas fever demonstrate the possibility of controlling and even eradicating the most virulent diseases when our knowledge of them is sufficient to indicate the proper measures. That the most destructive diseases of swine and other animals will be ultimately controlled or eradicated is almost certain, and to hasten this result the scientific investigations should be maintained and made more comprehensive.

A short time ago, I regret to say, there was an announcement made under the authority of a State official, referring to an outbreak in a Western State, which was characterized as "foot-and-mouth disease." Issued under such auspices it was given extensive publication, but fortunately my attention was called to it at the start, and I immediately telegraphed the governor of the State in question, requesting him to do all that was in his power to repress the spread of a rumor which I felt sure must be groundless and announcing my intention to have the matter immediately investigated by a competent authority. I at once dispatched one of our veterinary inspectors to the spot and received from him a report confirming my anticipations to the effect that it was not the disease known as "foot-and-mouth disease," and, furthermore, that it was not a contagious disease at all. Immediately on the receipt of this reassuring report, I cabled the facts to our consul-general's office in London, in order that he might make it public there, the unfortunate rumor to which I refer having already been reproduced in British journals.

I desire to emphasize here the danger of giving out statements of this kind without a thorough investigation. Immediate communication with this Department will always find me willing to co-operate in an investigation of this kind, and, until the exact facts are ascertained beyond a doubt, no statement alleging the existence of a dangerous contagious disease should be given to the public. It is no exaggeration to say that the losses to our cattle growers from unfounded rumors of such diseases have been infinitely greater than the actual losses occasioned by the diseases themselves.

COLLECTION AND DISTRIBUTION OF INFORMATION.

The information obtained from year to year by the scientific investigation of diseases must necessarily form but a small portion of the existing knowledge on the subject of disease, and must be used in connection with what has been previously acquired in order to give satisfactory results. For this reason I have deemed it of great importance that reliable reports should be issued, treating systematically of the common diseases of animals with special reference to prevention and

treatment. Taking these as a basis for comparison with the results of investigations issued annually, the farmer will be enabled at all times to obtain full information in regard to any disease with which his stock may be affected.

The first report of this series on the Animal Parasites of Sheep has recently been issued, and a second report on the Diseases of the Horse is now in press. Other volumes are in preparation and will be issued as rapidly as possible. The favor with which the announcement of these publications has been received shows that they will supply a variety of useful knowledge which has been greatly needed by the agricultural community.

Various lines of investigation are being vigorously prosecuted with the design of showing the actual condition, means of improvement, and future prospects of various branches of the animal industry. A full report on the Sheep Industry is in preparation, well advanced towards completion, and will probably form the first volume of this series. Reports on the American Trotter and the Thoroughbred Horse of the United States will be ready for the press at about the same time. This brief statement of the reports now nearly completed will serve as an indication of the character and scope of this section of the work of the Bureau of Animal Industry.

Last February I received an invitation to attend an interstate convention of cattlemen, to be held the following month at Fort Worth, Texas. Though unable to attend, I was impressed with the character and scope of the work indicated in the call for this meeting, and detailed a special agent of this Department to be present. I also sent a stenographer from this Department, with instructions to take a full report of the proceedings for my information. One of the subjects which was thoroughly discussed at the important convention in question, at which thirteen States were represented, was the urgent necessity to cattle growers for more extended information on the subject of the cattle supply of the country, the condition of the cattle markets, and the relation of quality to price in the cattle marketed. I have given this subject considerable attention, have invited an exchange of views on the subject from prominent cattle men, and have concluded that an earnest endeavor to secure information of the kind desired must be made by this Department through the Bureau of Animal Industry and its agents. It is merely carrying out the conviction which I have frequently had occasion to express elsewhere, that the peculiar circumstances of our agricultural people and their lack of facilities such as are enjoyed by people whose occupations require them to live in cities, within easy access of all centers of information relating to their business, make it the imperative duty of this Department to supply this lack as far as possible, and I have determined that an earnest effort in this direction shall be made during the coming year.

DAIRY AND POULTRY INTEREST.

In my last report I announced my determination to establish in the Bureau of Animal Industry a special division devoted exclusively to the service of the dairy interest. The act of appropriation, with the changes made in the appropriation for the needs of this bureau, making it possible to carry this determination into effect, was passed so lately, that the thorough organization and equipment of an important division of this character has not yet been possible. The present encouraging condition of the dairy interest, its vast extension throughout this country, and the general appreciation of the necessity for the successful conduct of the dairy business, of the strict application to the feeding of dairy cattle of the most scientific principles, and of the application to the business of perfect methods, renders the establishment of a division in this Department which shall be the natural leader in these matters a necessity. Such a division should moreover be able to extend material benefit to the dairy interests of this country by lending its aid to the extension of our export trade in dairy products and to the development of the manufacture at home of every dollar's worth of dairy products which we consume, an object which will be still further facilitated by the recent increase in the duty on cheese, a product which constitutes almost our entire dairy import.

Regarding the poultry interest, I am inclined for the present to place it in the special charge of the Dairy Division. Even though it may not be essential that this interest should be represented at present by a special division, the magnitude of the interest requires that some one division be charged with its supervision. The poultry products of this country represent in the aggregate a vast sum; and the industry is one which exists, or should exist, on every farm in this country, and which, consequently, interests a larger number of the constituents of this Department than any other single industry. In this connection I congratulate our poultry raisers on the recent change in the law, which instead of admitting imported eggs free, now levies on them a duty of 5 cents per dozen. The large imports of eggs into this country in past years, which it seems have come not only from our neighbors in Canada but even from across the ocean, amply justifies the imposition of this duty.

DIVISION OF CHEMISTRY.

A review of the work of the Chemical Division during the past year shows that it has been carried on with diligence and success. New and commodious quarters have been acquired for the use of the division, and many mechanical facilities have been provided which it was impossible to find in the old quarters in the basement of the main building.

Work in connection with the adulteration of foods has been heartily sustained by Congress, and an increase in the appropriation has been made therefor. This is a work which should have the sympathy of

every legislator and the help of every honest man. The adulteration of human food is an evil whose proportions are growing, I am sorry to say, from year to year. It is an evil destined to undermine and destroy health; and its practice not only interferes with the sale of products honestly manufactured, but also casts discredit upon our goods in foreign countries, corrupts morals, and places a premium upon dishonesty. I hope to be enabled, through the Chemical Division, to analyze specimens of every product placed upon our market in competition with pure goods and products of the farm, and the co-operation of Congress in these efforts is earnestly solicited. Investigations during the past year have related particularly to the adulteration of tea, coffee, chocolate, and other table beverages. These results are now nearly ready for delivery to the printer.

These investigations show that the adulteration of such articles is not very extensive, and, except in the case of tea, is easily distinguishable. The most frequent one is the introduction of substances to give additional weight, such substances as will attach themselves readily to the leaves and yet not be easily distinguished by the eye. These substances are mostly of a harmless character, although some of them have been found to be deleterious. In the case of coffee the chief adulterations have been found in the ground coffees, the difficulty of adulterating the berry, whether roasted or unroasted, being so great as to almost exclude this kind of fraud. With the green berry, the chief adulteration seems to be in exposing it to a moist atmosphere that it may absorb moisture and thus increase in weight; but this is a species of fraud which is easily distinguished, since the simple drying of the berry and the estimation of the water contained therein is sufficient to determine whether or not it has been thus exposed.

Extensive investigations have also been made in regard to the adulteration of sugar, molasses, honey, and confections, and the publication of this work will speedily follow that of the work on the adulteration of table beverages.

A thorough study of the materials which prevent the crystallization of the sugar in sorghum juices has also been made, these substances have been identified and studied, and the best methods of removing them from the sorghum juices have been investigated.

Coupled with this work has been the continuation of the experimental station work for the development of varieties of sorghum which are as free as possible from these deleterious substances, and containing as high a percentage of sucrose as can possibly be obtained by years of patient selection of seed and careful cultivation of the cane. Some remarkable results in cultivation of this kind are now on record.

In 1889 four varieties of cane were studied for thirty-five days, giving in that period an average of 14.15 per cent. of sucrose in the juice, 1.15 per cent. glucose, and having a purity coefficient of 77.5. The present year seven varieties of cane, for the same length of time, showed an

average of 14.48 per cent. sucrose, .77 per cent. glucose, with a purity coefficient of 76.40. The best varieties of cane this year showed, for fifty-one days, from August 25 to October 15, 15.48 per cent. sucrose, .51 per cent. glucose, with a purity coefficient of 78.36.

It is proposed to continue these culture experiments for the purpose of developing and introducing all varieties of sorghum cane which give any promise whatever of becoming useful. In all, the Department has experimented with about 800 varieties and subvarieties of cane. Many of these, on investigation, proved to be duplicates of others which had come to us under separate names. From this extensive list, after three years of careful investigation, all have been eliminated except ten or twelve distinct varieties which possess the essential qualifications of sugar-producing plants, viz., high sucrose content with a low content of other substances. Work will be continued with these selected varieties until their excellent qualities are rendered permanent by continued selection and by improvement due to careful cultivation. It is believed that the sorghum plant will then be able to compete successfully with the sugar cane and the sugar beet, but only in those localities where soil and climate are best suited for the production of the sorghum plant in its highest perfection.

The investigations so far completed show that the localities in which sorghum can flourish are confined to the semi-arid region of the country, notably beginning in Central Southern Kansas and extending southward indefinitely. The investigations have also shown that sorghum of excellent quality can some seasons be produced in other parts of the country, but the uncertainty of suitable climatic conditions would seem to render it advisable to attempt the production of sorghum for sugar-making purposes only in the localities indicated.

Investigations by the Department in respect to the production of sugar from the sugar-beet have also been of the most extensive nature. During the early spring 5,000 packages of sugar-beet seed of the most approved varieties were obtained from European growers and sent to all persons in the country who had applied for them. Arrangements were also made by which the beets, after maturity, could be sent to the Department for analysis. As a result of this arrangement beets have been received from about one thousand different localities in all parts of the country, and these have been analyzed in the laboratory. The results of the analysis are, for the most part, extremely favorable, especially with those varieties which have come from the northern and central portions of the country. It is not uncommon to find beets containing 15 per cent. of sugar, while in exceptional cases the percentage of sugar has risen as high as 20. We have also found many beets of a strictly typical character, combining a perfect shape with the proper weight and a high content of sugar. A typical sugar beet is conical in shape, smooth in its external contour, with a white, solid interior, weighing about one pound, and having a content of sugar of about 14

per cent. Many samples of such beets have been received, showing that it is possible to produce in this country sugar beets of the highest type.

In Bulletin No. 27 are given the results of a careful study of the soil and climatic conditions of the country suitable to the production of sugar beets, and a map has been prepared showing a zone within which the most favorable results will probably ensue from the cultivation of the sugar beet. A large beet sugar factory has been erected at Grand Island, Nebraska, equipped with the most approved modern machinery, and this factory is now working sugar beets at the rate of 300 tons per day. There is every reason to believe that the encouragement which has been extended to the sugar beet industry, by the investigations of the Department and by act of Congress, will result ere long in the establishment of many additional sugar factories in those portions of the country which the data obtained by the Department show to be best suited for the purpose. When it is considered that 250 beet sugar factories of the size and capacity of those now in operation in California and Nebraska will be sufficient to make one half of the total sugar consumed in the United States, it is not idle to expect that in the course of a few years a large proportion of the sugar consumed in the United States will be made therein from the sugar beet.

Further investigations of the Chemical Division have had relation to matters more specifically connected with the agricultural experiment stations and the best methods of analysis to be used therein. Investigations have been made of these methods in the laboratory, and these have been carefully compared with other methods, so that the best could be secured. In this work the co-operation of the agricultural chemists throughout the whole country has been enlisted in an organization known as the Association of Official Agricultural Chemists, whose annual conventions are held in Washington under the auspices of the Department of Agriculture and whose proceedings are published as bulletins of the Chemical Division. Bulletin No. 28 of this division containing the proceedings of the association meeting held in August, is now ready for the press.

DIVISION OF STATISTICS.

The operations of the Statistical Division have been replete with activity in various directions. The necessity of statistics in the work of legislation is becoming more and more imperative, as attested by the demands upon this office during the extended session of the present Congress. The discussion of industrial and economic questions in the halls of legislation, in polemic discussion, in literature and journalism, makes constant demand upon the resources of the Statistical Bureau for the facts of production and distribution, prices of products, wages of labor, development of resources, and status of agriculture.

The year has been somewhat peculiar in its statistical record. An abnormally mild winter, characterized by verdure and vegetable growth until late in the season throughout all but the higher latitudes, was closed with a period of low temperature and frosts, which extended southward to the orange belt of Florida. The effect of conditions so extreme was injurious to all the winter grains and to all the orchard fruits, forecasting the reduction in area of winter wheat which followed, the unequal rate of yield for the breadth remaining, and the unexampled dearth of nearly all kinds of fruits. Even the Pacific coast had an exceptional experience, consistent in its proverbial unlikeness to Atlantic coast conditions, for while the country from the great mountains to the eastern seacoast was singularly mild and summer-like, the Pacific slope was cold and stormy, with heavy rainfall and an unusually late spring.

The spring weather of the East was unfavorable to early planting, being too cool and wet at many points. These conditions were favorable to the hay crop, which is very valuable everywhere, and in the South becoming vastly more important every year as the improvement of farm animals progresses in that region, promising to make stock-growing a very prominent rural industry of the cotton belt, which is in many respects peculiarly adapted to profitable extension of the various forms of animal industry.

The great arable crop of the country, corn, has had an unfavorable development. Starting in July with a condition expressed by the average of 93.1, which was less promising than the record of the previous year, but by no means discouraging, the effect of drought reduced the average in sixty days to 70.1; and on the 1st of October, when the crop was matured, the record stood at 70.6, against 91.7, indicating a prospect for 23 per cent. decrease in the rate of yield compared with that of last year. This foreshadows a reduction of something like half a billion bushels of corn. Still there is a fragment of last year's crop remaining, and there will be ample supplies for consumption of high-priced corn. The amount consumed depends much upon price, and the export demand is influenced far more by this consideration than the domestic consumption.

The winter wheat crop was reduced by spring frosts, and the spring wheat in its drier areas by drought, so that the average condition when harvested was expressed by 75.5, against 87.5 last year, indicating a yield materially less than that of 1889, upon a reduced area. The oat crop has met with serious disaster, reducing its product more than two hundred million bushels. It has also been a year of partial failure of the potato crop. The reports of condition have been growing worse since July, and as the time of harvesting approached the yield was still further reduced by the prevalence of rot. The Southern crops are generally above an average in production. The cotton crop of last year was the largest ever grown and brings a good price, and

the prospect is now good for another large crop. The sugar product is also large, probably the largest grown for many years. Rice, tobacco, and vegetables have generally yielded well, and among the results is a high degree of prosperity in nearly all branches of Southern agriculture.

The despondency which was caused by the low prices of the beginning of the year has already been measurably dispelled by the advance in agricultural values, and good grounds exist for the belief that our farmers are entering upon a new era of profitable culture and general industrial prosperity.

DIVISION OF ENTOMOLOGY.

The year has not been marked by any very serious insect injury of a general character, though the work of this division has been steady and unremitting. During the past few years the boll worm of cotton (*Heliothis armigera*) has been a source of more than usual damage to cotton planters, particularly in Texas, Southern Arkansas, and parts of Mississippi and Louisiana, doing more harm than even the cotton worm (*Aletia ryliana*.) The edition of the fourth report of the U. S. Entomological Commission, treating of the cotton worm and boll worm, is exhausted, and there has been a general demand from the States interested for a supplementary investigation of the pest. Congress appropriated a small sum for this purpose, and the investigation has been begun. Agents of the division have been stationed at College Station, Tex., Pine Bluff, Ark., Holly Springs, Miss., and Shreveport, La., and the work of study and practical experiment has been apportioned so as to bring about the best results. The appropriation became available too late in the summer for efficient work, but the work this season will prepare the way for more thorough work next year, and if there is any possible way of giving our planters more effective and practical means of overcoming this enemy than those now at command, I have confidence that the way will be discovered.

During May there was a local outbreak of the army worm (*Leucania unipuncta*) in certain portions of the State of Maryland, and an agent of the division was sent to investigate it. There were some features about this outbreak that appeared abnormal, and the entomologist will consider it in his report in connection with another insect that is often mistaken for the army worm and which is much subject to an epidemic disease, a fact which acquires importance because of the possibility of artificially conveying this disease to the boll worm.

During July and August alarming rumors of the destructive appearance of the Rocky Mountain locust, or western grasshopper (*Melanoplus spretus*), were received from Idaho and Utah, and an agent of the division was sent to investigate them. He found that the locust in question was not the western migratory species, but a comparatively local form known as *Camnula pellucida*, information most reassuring to

farmers in the Mississippi Valley. The means adapted to combating this last mentioned locust are identical with those which were found efficacious in the case of the first mentioned. The report of the Entomological Commission, containing the necessary instructions, is unfortunately out of print; but for the benefit of farmers situated in the district threatened by the present pest, I have directed the entomologist to prepare a summary of these instructions for distribution throughout the section of country subject to the present visitation.

Further experiments have been made with the use of hydrocyanic acid gas under tents as a remedy for the red scale. In my last report the statement was made that the cost of this remedy had been greatly reduced by experiments made by one of the California agents, and further experiments have developed means by which the process may be easily rendered more efficacious and the expense still further reduced.

The horn fly of cattle, which attracted so much attention last year, seems to have been much less abundant during 1890, and complaints from stockmen have been comparatively rare. Observations confirmatory of the results recorded in my last report have been made, and late fall and winter observations show that this insect hibernates in the preparatory state in the ground.

The question of the damage of the grape by phylloxera in California has been taken up, and certain vine-growing regions of the State have been visited by an agent, who is making tests and observations.

The division has been appealed to in reference to the possible danger of the importation of the destructive Florida scale insects into California, a matter which has attracted a great deal of attention the past season in the latter State. It seems that frequent accidental importations of these scales, particularly of the purple scale, the long scale, and the chaff scale, have been made; but in no case have the insects become destructive. It is therefore argued by many that the climate of the Pacific coast is not favorable to their increase, while others hold opposite views and are much alarmed. The entomologist is of the opinion that, while there are some grounds for the former belief, we can not exercise too much care in preventing the carrying of these destructive scale insects from one section to another. I have therefore been particularly careful to have the plants received from foreign countries and to be shipped to the different States carefully disinfected before such shipment, as I am very anxious that the Department shall not be the means of further disseminating such noxious species. I earnestly recommend that similar precautions be taken by all nurserymen and horticulturists shipping plants to other States.

In view of the success that has attended the importation of the Australian lady-bird to prey upon the fluted scale in California, public attention has been specially drawn to this manner of destroying injurious insects through the instrumentality of their natural enemies, but success in any instance is not likely to follow without the most com-

plete, thorough, and intelligent direction. The entomologist, fully realizing the importance of this question, has made various efforts during the year, so far as they can be made with the assistance of foreign correspondents equally interested in the subject, to import desired species, and to reciprocate by sending others abroad.

The increased appropriation to this division will justify renewed attention to the subject of bee culture, and plans are being formed to carry on whatever investigations will tend to advance this important industry. The investigations already made under direction of the entomologist had for their object the control of the fertilization of the queen, whereby bee keepers would be able to improve the disposition and the honey-producing qualities of their bees by selection, in the same manner in which the stock breeder and the fruit grower have for so many years so successfully improved our domestic products. There is reason to believe that this can be accomplished with reference to the bee; but there are many other ways in which the Department can help the bee-keeper in investigations on a scale which neither individuals nor associations can afford to pursue. This is especially true in reference to the study and introduction of bee plants from sections of the country or other parts of the world where they are valuable into sections where they are not yet known. This applies also to the introduction of bees known to have desirable qualities, as, for instance, the *Apis dorsata* of Ceylon.

Many other insects of less importance have been carefully studied and figured, notably the rose chafer, concerning which a complete article has been published in the periodical bulletin of the division. The publications of the division have occupied more of the time of the office force than usual. The issue of *Insect Life*, the periodical bulletin, has been continued, and most encouraging comments concerning the usefulness of this publication are constantly received.

DIVISION OF MICROSCOPY.

The following is a brief abstract of the work upon which the Division of Microscopy is engaged for the current year: Original investigations in the interest of pure food stuffs, including medicinal and food oils and condiments. In food stuffs the skillful use of the microscope is constantly demanded to meet the new methods and combinations practiced in the adulteration of butters, lards, and branded substitutes for butter and lard, as well as in the examination of the various other food products. A microscopical examination of certain lard compounds in relation to the lard bill of the Fifty-first Congress was made by this division for, and at the request of, the House Committee on Agriculture.

The study of economic textile fibers is also a part of the work of the year. The various structural characteristics of textile fibers, which represent their felting properties, in respect to which they greatly differ, will be illustrated.

A further and more comprehensive illustration of our native edible mushrooms, as well as of poisonous varieties, and of those which may be classed as doubtful, is in progress as part of the year's work.

DIVISION OF ECONOMIC ORNITHOLOGY AND MAMMALOLOGY.

During the past year the work of this division has been continued in the two lines of research mentioned in previous reports.

(1) The work on geographic distribution of species has received as much attention as the means at the command of the division would permit, and considerable progress has been made both in the study of the faunal areas of the country and in mapping the distribution of species.

A report of the work done in Arizona during the summer of 1889 has been published as *North American Fauna*, No. 3. It gives in detail the results of a biological survey of about 5,000 square miles in the northern part of the Territory, and is accompanied by accurate maps of the forests of the region. The practical scientific value of such a survey is self-evident, and it is hoped that the division may be enabled to extend this work to other and larger areas.

The study and mapping of faunal areas—those fitted by nature for the existence of peculiar associations of animals and plants and consequently for the production of certain crops—has progressed far enough to warrant the issue of a provisional map. Such a map, showing by different colors the principal life areas of North America, has been prepared and accompanies *North American Fauna*, No. 3.

In order to obtain more complete data respecting the breeding range of various species of birds, a special schedule was prepared and sent out early in the year, and already reports have been received in reply from nearly four hundred localities. These reports contain much valuable information which is being tabulated and mapped as rapidly as possible.

The most important field work accomplished during the present year has been that done in the Salmon River Mountains in Idaho, under the personal supervision of Dr. Merriam, chief of the division, assisted by Mr. Vernon Bailey and Mr. Basil H. Dutcher, field agents of the division. This work, which is still in progress, has already brought to light many facts of economic and scientific value concerning this almost unknown region, and has resulted in the discovery of several species new to science. Important work has also been carried on in the arid regions of the West, especially in Texas, Wyoming, Utah, and Washington; in the latter State an effort is being made to determine the northern limits of the "basin region."

(2) The economic work of the division, that devoted to the study of species directly injurious or beneficial to agriculture, has been mainly confined to investigations connected with the preparation of four dis-

tinct bulletins, namely, (a) an illustrated bulletin on hawks and owls, now almost completed, which, it is hoped, will be ready for distribution soon; (b) a bulletin on the gophers of the Mississippi Valley, on which work has been continued during the year and much valuable information secured concerning the distribution and ravages of the several species; (c) a bulletin on the common crow, already far advanced, and (d) a bulletin on crow blackbirds, now well under way. In connection with the work on these bulletins more than eight hundred stomachs have been examined during the past year, while about two hundred more, mainly those of bobolinks and meadow larks, have been examined in response to special requests for information as to the food of these birds.

A little time has been devoted to the collection of published notes by other workers in this little-known field, but the records are so few and so widely scattered that as yet only a beginning has been possible.

In connection with the stomach examinations the utility of the reference collection of seeds has been demonstrated almost daily, and although very considerable additions have been made during the year, this collection is still lamentably incomplete. The facilities for the determination of stomach contents have been materially increased and a competent biological clerk has been added to the force of the division.

More than 4,000 specimens have been sent in for identification by field agents and others, and a large and increasing correspondence has been conducted since January 1, 1890.

DIVISION OF FORESTRY.

Although there is evidence of a growing appreciation throughout the country of the importance of the interests which this division is designed to serve, there is still need that the scope and character of its work be explained and illustrated. The day when forest planting and the application of scientific principles to the management of our natural forest areas will be generally recognized as a necessity, is certainly approaching. While our forest resources are still immense, signs of approaching exhaustion in certain directions are already apparent. Carriage timbers especially are becoming scarce. The scarcity of walnut has long been known, and trade papers are beginning to discuss the difficulty with which first-class white pine stock can be secured and to note the abundance of culls in the market, a sign that this staple resource, often represented as inexhaustible, must have been considerably reduced.

Without, therefore, entertaining alarming apprehensions of timber famine in the near future, it is a wise policy to keep watch over our forest resources, to show how unnecessary waste can be avoided and the means of economy developed, and to teach those principles by the application of which the natural forests may be so utilized as to recu-

perate and reforest themselves with valuable timbers, and also to teach how to create new forests artificially. It is the duty of this division, furthermore, to point out the consequences upon water and soil conditions of imprudent and undue deforestation. Although better endowed than formerly by the appropriations for the current year the Division of Forestry is not yet equipped for field work, or, indeed, for any but scientific investigations that can be carried on in the office or laboratory, or by studies in the natural forests.

The two lines of investigation which will continue to be foremost, and for which the present appropriations insure more effective prosecution than formerly, relate to the life history of our important timber trees and to studies into the relations of the quality of timber to the conditions of its growth. Monographs dealing with the former subject are in hand for publication during the coming winter. The latter investigations will require careful selection of study material, laborious laboratory work, and a large number of tests, and promise to afford results of marked interest to the forester and of great practical value to the engineer, the builder, and indeed to every worker in wood.

During the year there has been published in the interest of forest conservation a very exhaustive report on the experiences of the world in regard to metal ties. This publication is full in mechanical detail, and will serve, it is hoped, to stimulate our railroad managers to give further trial to this substitute for wood material, since it is said to be of improved efficiency and ultimately most economical. Whenever it has been practicable, the chief of the division has been detailed to attend the various forestry conventions and other meetings where it has been believed that interest in forestry matters might be stimulated or advanced.

To accompany distribution of tree seeds, which, to satisfy the demands of the law, is made in small quantities proportionate to the appropriation, a circular giving detailed instructions for handling the seeds was prepared and distributed. It is thought best to restrict the distribution of plant material, as far as possible, to such kinds as are not readily obtainable, or to such as for some other reason are not likely to be tried by the would-be planter, and to engage the experiment stations in the trial of new species rather than leave this work to inexperienced hands. Excepting an importation of Austrian osier rods, which were sent to the experiment stations, only native seeds have been distributed.

RAINFALL EXPERIMENTS.

An amendment to the act of appropriation for this Department was adopted at the last session of Congress placing at my disposal the sum of \$2,000 "for experiments in the production of rainfall," it being understood that such experiments were for the purpose of ascertaining whether such a result could be attained by the use of explosives. The

difficult and problematical nature of these experiments, and the necessity of undertaking them only under the direction of a person possessing thorough qualifications for conducting the work, has made it thus far impracticable for me to give the matter proper attention. The experiments will, it is expected, soon be inaugurated.

DIVISION OF BOTANY.

As stated last year, two distinct lines of research are carried on by this division—the scientific and the practical. Under the first gratifying progress has been made in the collecting, classifying, and mounting of plants growing in all parts of the United States, as well as others secured by exchange or otherwise from foreign countries.

The herbarium of the Department of Agriculture has become of national importance and of great money value, and some of its parts could never be duplicated if lost or destroyed. Its location in the Department building, which is not fireproof, is a source of great anxiety, not only to those who have charge of it, but to the scientific world. The American Association for the Advancement of Science at its last meeting passed a strong resolution urging the Department of Agriculture to furnish fireproof quarters for it.

The Department has lately commenced the publication, in a special series, of the information which it is enabled to gather from study and comparison in the herbarium. This information is embodied chiefly in scientific papers, designed more especially for botanists, and intended to supplement the more practical work of the bulletins. The special series is not a periodical, but numbers are issued as often as sufficient matter accumulates. Three numbers have already been distributed. Nos. 1 and 3 relate to the flora of Southern and Lower California, and No. 2 is a catalogue of Texas plants, which is preliminary to a manual of the flora that State soon to be published by this Department.

In the collection special note is made of all economic plants. So far as concerns forage plants, bulletins are issued, illustrated by plates, describing their characteristics and value for forage purposes, and setting forth the soils and climate to which they are adapted. During the year two such have been issued, one a new, revised edition of the "Agricultural Grasses of the United States," the other, Bulletin No. 12, entitled "Grasses of the Southwest." Both bulletins have received the highest commendation from farmers and from botanists. They exemplify in the best sense the value of scientific work applied to practical uses.

The experiments undertaken by the Division of Botany with a view to increase the grass production of the arid lands of the West have thus far demonstrated that a decided improvement in this matter is practicable; that the introduction of certain methods of cultivation and of certain forage plants not before used renders possible great ad-

vance in the grazing industry of those regions. Congress at the last session, appreciating the importance of the experiments, increased the appropriation therefor, to enable this Department to arrange with all the Western stations for co-operative experiments under our supervision. The chief of the division has about completed an extended tour of the West and South, made for the purpose of arranging the plan of the work and more carefully studying the conditions of soil and climate. The operations at the government grass station, at Garden City, Kans., have been very satisfactory, and for that locality the results have been fully equal to our expectation.

DIVISION OF VEGETABLE PATHOLOGY.

Since my last report Congress, in accordance with my recommendation, has made the Section of Vegetable Pathology a division, and it is now thoroughly organized and equipped with an efficient corps of workers in both the field and the laboratory.

A special effort has been put forth during the past year to make the field work as thoroughly practicable as possible, and with this end in view the chief and several of his assistants have spent considerable time making experiments which I believe to be of great practical value. To show the importance of this work I will cite the case of one series of experiments personally conducted by the chief, the results of which are based on very careful records. The remedies used were those whose efficacy have been established by this division, and the object of treatment was a large nursery whose proprietor had offered his entire stock to the Department for experiment. This work extended over two years, the expense involved was a little over \$125, and the amount saved was \$5,000.

This division was the first agency in this country to introduce the use of fungicides for grape diseases, and it is estimated as a result of its work that nearly five thousand grape growers in all parts of the country treated their vineyards for mildew and black rot in 1890, and the amount of fruit saved in this way will vary from 50 to 90 per cent. of the crop.

In addition to the foregoing, experiments in the treatment of pear, apple, quince, and numerous small fruits have been conducted in New Jersey, Maryland, Virginia, Wisconsin, and Missouri. The diseases of other crops, such as cotton, tomatoes, potatoes, etc., have been under treatment in numerous widely separated localities, each of which was selected as being particularly adapted to the work in hand.

The laboratory work has been pushed forward with vigor, the principal subjects under investigation being peach yellows, the California grape disease, pear blight, cotton diseases, a bacterial disease of oats, and the so-called "rots" of the sweet-potato.

The laboratory investigations of the California grape disease have been mainly in the line of bacteriological study of diseased parts of the

vine supplemented by inoculation experiments, with a view to determining the contagious and non-contagious nature of the malady. Numerous facts bearing on this subject have been accumulated, and these will be shortly embodied, together with a result of the field observations and experiments, in a report soon to be published. In May of this year the special agent engaged in this work asked and was granted leave of absence without pay for six months, in order that he might visit France, Spain, Italy, and Northern Africa, in search of information that will aid him in his work.

For many years the vineyards of these countries have been ravaged by a disease which, according to the published account, is very similar to the one in California. It was claimed that within the past two years the disease had almost entirely disappeared from certain portions of Italy, and it was principally to get some definite information in regard to this matter that the agent desired to personally inspect the European vineyards. It is hoped that his investigations will enable him to throw some light on the best means of combating the California trouble, which has already devastated thousands of flourishing vineyards, causing losses almost beyond calculation.

The peach-yellows work is being prosecuted with vigor along practically the same line followed last year. Some important results bearing on the treatment of this disease have been obtained, but as yet they are not sufficiently conclusive to warrant their publication.

The publications and correspondence of the division have assumed such proportions, that to give them the attention they deserve requires about one third of the time of the regular office force. Two special bulletins and four numbers of the Journal of Mycology have been issued since my last report, and the fact that the editions of these are now entirely exhausted is, I believe, a sufficient guaranty of the interest in the work.

DIVISION OF POMOLOGY.

The development of the fruit industry throughout the country and in parts of the country where not long since it was thought no fruits could be grown, has been steady and encouraging. It must not be forgotten in estimating the value of pomological work in the United States that we Americans pay to foreign fruit growers more than \$20,000,000 per annum for fruits and nuts which we import. I am convinced that one of the ultimate rewards of scientific pomology will be to see very nearly the whole of this vast sum turned into the pockets of American fruit growers, so wide is the range of climatic variation in different sections of our vast country. To accomplish this result necessitates a special study of and experiment in the study of fruit culture; and it is my hope that the Pomological Division of this Department will contribute an important share to this great work.

Special agents have been appointed to obtain information regarding

fruit culture in their respective localities, and to report to the pomologist as to their wants and resources. A system of reciprocity between the division and the various national, State, and local societies of a pomological nature has been inaugurated. The identification of fruits sent from all parts of the country is becoming more and more useful as a part of the work of this division, and during the past year there has been a very great increase in the number of samples sent for this purpose. It is evident that this portion of the work of this division is highly appreciated by the fruit growers of the country.

I am glad to be able to state that in pursuance of the work of this division, which involves the effort to introduce foreign and untried varieties and species of fruits into this country from abroad, a successful importation was made during the year of the date palm from Egypt and Algeria. Sixty-three trees, representing eleven of the choicest varieties, were received and were found on arrival to be without exception in good condition. This is the first instance of the successful introduction of rooted suckers of any variety of the date to this continent. Their transportation has frequently been attempted, but the plants have never survived the voyage. There are good grounds for anticipating their successful introduction in the arid regions along our extreme southwestern border, and their introduction is a notable event in the pomological history of the country.

The division has in course of preparation a special report upon nut culture, and it will be based upon the practical experience of those who have already given this subject attention, and such information and advice will be given as may prove of benefit to those who desire to engage in it. Many choice varieties of wild nuts, especially of the chestnut and pecan, have already been discovered in the course of the investigation of the subject, and these will be obtained and placed in the hands of careful experimenters. Choice kinds of the filbert will also be brought from England and placed where it is likely they will succeed in this country.

One of the important features of the work of this division is an investigation of our wild fruits. This investigation should be more thorough than the means at hand enable me to make it, but no field of pomology is more promising of good results than this, and I trust that by enlisting in the work the cordial co-operation of the various experiment stations throughout the country much good may be accomplished even with the limited means on hand.

SILK SECTION.

I stated in my last report that, in regard to silk culture, the real question to be determined as to the possibility of establishing this industry in the United States is that which concerns the reeling of silk, the conversion of the cocoons into a marketable thread.

While I have looked for assistance in the solution of this problem and the improvement of machinery for reeling silk, I have nevertheless become quite convinced that, even with such machinery perfected, it would be necessary for manufacturers to have some encouragement, either in the shape of a duty on imported raw silk or a bounty for such as might be produced in the United States. The importance of this subject and the desirability of establishing such an industry are beyond dispute, and, as though to strengthen the claim on behalf of home-grown silk, we find a great increase, nearly 25 per cent., in the imports of unmanufactured silk during the last fiscal year over the preceding one; the imports of this product for the fiscal year ending June 30, 1889, being in value, \$19,333,229, and for the fiscal year ending June 30, 1890, \$24,331,867. Under those circumstances, I confess that it would be a source of great regret to me to see the abandonment of all efforts looking to the establishment of silk raising in the United States, but I can not but reiterate my conviction that to all the improvement in mechanical devices which American ingenuity can bring about must be added the benefit of legislative encouragement. Should some bill embodying this idea become a law during the coming winter, it will afford me great pleasure to be the instrument for executing it and creating for this industry a brighter outlook than at present exists.

TEXTILE FIBER INDUSTRIES.

The fiber investigations commenced in 1889 have been steadily pursued with encouraging results. Much valuable information has been collected showing the present status of different branches of the fiber industry in this country and in Europe, a portion of which has already been given to the public in Bulletin No. 1 of the fiber series. Since the beginning of the year nearly 400 specimens of fibers and fiber plants have been received, many of them from farmers and others seeking information regarding possible new fiber interests, or exhibiting to the Department results in cultivation, preparation, or manufacture of known fibers.

Among the examples of American flax received by the Department are several fine samples grown in Wisconsin, Minnesota, Iowa, and on the Pacific coast, one of which, from the first named State, is declared by a leading manufacturer to be "good enough for even fine linens." A fine sample was also received from Texas. A beautiful example of linen thread, grass-bleached in New Jersey, demonstrates that this branch of the linen industry can be carried on in the United States as successfully as in Europe; while the entire linen series proves conclusively that even fine flax, in any quantity, can be produced in this country with skill and careful culture. The new tariff law raises the duty on dressed line from two cents to three cents per pound, and gives to the manufacturer of crash and the coarser linens an immediate addi-

tional protection of 15 per cent. ad valorem. This makes an American flax industry possible. The early establishment of large linen factories in this country will assure a market for American grown flax, and the duty of three cents per pound on the dressed line, it is thought, will enable the American grower to produce flax fiber with profit to himself.

As flax culture is a new and untried thing with many farmers, the Department will render all aid in its power towards re-establishing the cultural side of the linen industry. Already there is great interest in new machinery and processes for cleaning flax, and some of these give promise of good results.

Hemp culture has been largely extended in States north of the Ohio River, and a perceptible increase in the employment of native hemp in binding twine (in preference to the higher-priced imported sisal and manila hems) has been noted. Considerable areas of sisal hemp are growing in Florida, and it is thought that with a little encouragement at the outset sisal hemp might readily be produced within our borders. New Zealand flax is growing in California, from which strong fiber has been experimentally produced. Seeds of this plant, and of the manila hemp plant, have recently been imported and distributed for experiment in southern localities.

Several indigenous plants producing bast fiber, growing throughout the South, are under investigation and will be reported upon when the investigations are completed.

In regard to the ramie industry the chief progress of the year has been in the direction of manufacture rather than that of decorticating machinery, though the interest in this fiber continues.

ARTESIAN WELLS INVESTIGATIONS.

By a provision in the urgent deficiency act, approved April 4, 1890, Congress appropriated \$20,000, and directed the Department to investigate the proper location for artesian wells and their use in irrigation in the semi-arid region lying between the ninety-seventh degree of west longitude from Greenwich and the eastern foothills of the Rocky Mountains. The area includes the States of North and South Dakota, portions of Montana, Wyoming, Colorado, New Mexico, and Texas lying east of the Rockies and the lower Rio Grande River, with those portions of Nebraska, Kansas, Oklahoma, and the Public Land Strip that are west of the ninety-seventh degree. The appropriation was made available the 15th of April, and by the 20th of that month organization was perfected and field work begun by a large and competent staff of division geologists and field agents working under capable chiefs.

The field and official work was heavy, as the law required a report to be made as early as possible after the first of July. The supervising engineer and chief geologist made an intelligent, though rapid reconnoissance of the whole field, each of them traveling in doing so

about 12,000 miles. The entire field force covered at least 70,000 miles of travel during their work. A report of operations was made on the 22d of August to Congress. The reports of the special agent in charge, of the supervising engineer, the chief geologist, and of the several division geologists and field agents, are accompanied by valuable maps, diagrams, plans, and illustrations drawn from photographs taken for this investigation. Besides the three principal reports, there are four from division geologists, covering the Dakotas, Western Nebraska and Kansas, Eastern Colorado, and Southwestern Texas. These contain a mass of valuable data, locating and describing over 1,300 artesian, a large number of bored or gang wells, and several hundred springs, besides presenting important evidence as to the existence of other earth-waters in quantities sufficient for economic application to agriculture, when the same can be restored to and distributed over the earth's surface. The reports presented, under the provision of law of April 4, 1890, are confined directly to the location and availability of artesian waters, all other references and data being incidental. It was found necessary to make for the use of the investigating staff a definition of "artesian water." This was done in the following terms:

To include all subterranean waters, which, on being reached or opened from above are found to flow to a level higher than the point of contact, and from some permanent and general source rather than from a local and temporary one. All bored wells in which the water rises and all natural waters, such as springs, rising from below, are included in this definition, as artesian in character. These supplies may be divided into positive and negative, the first to include wells the waters whereof flow above the surface of the earth, the second to embrace waters rising with force, but not flowing above.

Taking into consideration the time employed, this series of reports must prove to be of decided economic value. They form a positive contribution to the science of hydrogeology or the phenomena of earth-waters, besides illustrating the possibility of an extensive agricultural utilization of such valuable supplies. A supplementary report relating to earth-waters, other than artesian, as defined by this investigation, is now being prepared, under a resolution adopted in June last by the Senate of the United States. This report will deal largely with the evidences of water underlying the river valleys and uplands of the Great Plains region, as under-sheet or underflow, and by percolation, seepage, and drainage.

The brief preliminary reports made to Congress of the artesian wells investigation, resulted in the passage of the following provision of the general deficiency act, approved September 30, 1890:

IRRIGATION INVESTIGATIONS.—To enable the Secretary of Agriculture to continue to completion his investigations for the purpose of determining the extent and availability for irrigation of the underflow and artesian waters within the region between the ninety-seventh degree of longitude and the eastern foot-hills of the Rocky Mountains, and to collect and publish information as to the best methods of cultivating

the soil by irrigation, forty thousand dollars: *Provided*, That no part of said sum shall be expended unless the entire investigation, collection, and publication contemplated herein, including the report thereon, can be fully and finally completed and printed before July first, eighteen hundred and ninety-one, without any additional expense cost, or charge being incurred.*

The extraordinary nature of the above proviso made the formulation of plans for carrying out the investigations enjoined upon me under the act a matter of very serious difficulty. Indeed, a too literal adhesion to the language of the act, embarrassed as it is with this provision, would make it well-nigh impossible to undertake the work at all. Assuming, however, after due consideration, that the intention of Congress was that these investigations should be continued, I at once proceeded to organize an irrigation inquiry, and to prepare to carry on the work of artesian and underflow investigation as far along towards completion as was possible by the exercise of the utmost diligence within the period provided. At the same time I felt called upon to instruct the gentlemen in charge that all reports must be completed and handed in on or before the 30th of April, 1891. The date at which the act was approved, and the early period at which I am obliged to call in the reports, necessarily curtail the time available for field service to a few weeks of field activity, and hence curtail the usefulness of this investigation.

Edwin S. Nettleton has been appointed as chief engineer of this Department, and Robert Hay as chief geologist. The engineer at once entered on field work in the Dakotas. He is also preparing plans for the prospective utilization in irrigation of the waters of certain artesian wells. These plans are to be the basis for constructing reservoirs, distributory ditches, etc., the cost of which is to be borne by land owners willing to meet the burden of such experiments.

It has been represented to me that underflow waters can be made available for purposes of irrigation by means of pumping at a less expense than that entailed by the building and maintenance of extensive reservoirs, dams, and ditches. Inasmuch, moreover, as the former plan, should it be found equally effective and economical, would place this matter of supply in the hands of the individual land owner, a feature which is in itself favorable to this plan, I have directed the chief engineer to make a special investigation with a view to supplying reliable information on this point, with such details in regard to the relative cost of the work as will substantiate or controvert the representations in question.

In October Prof. Robert Hay proceeded to Northwestern Nebraska, where, being soon joined by the chief engineer, a series of observations were at once made, both investigations moving southward as rapidly as possible, examining Western Nebraska and Kansas, the adjacent section of Colorado, and the important drainage basins of the Canadian and Pecos Rivers within Eastern New Mexico. Levels are

being run across this mid-section of the Great Plains, and investigation of the underlying strata, their position and relations to the wells, springs, and other evidences of earth-waters, are in progress, the results of which I hope to submit to Congress at an early day. It is hoped by these levels and field investigations to quite definitely locate the sources, nature, and extent of the subterranean water supplies. Similar field work will be continued in the Southwest throughout the winter, and at the earliest date that the season will permit active labors will be resumed along the whole line.

The Irrigation Inquiry Office, under the direction of Special Agent R. J. Hinton, is preparing by my orders a concise but comprehensive progress report on irrigation, its development, and the cultivation of the soil thereby. Monographs and reports will also be made through this office by specialists and experts, who will examine and report on such divisions of the arid region as they are most familiar with. This series of papers will include, among others, monographs on irrigation and water supplies in the mid-plains section, Colorado and Wyoming; the basin division, including Northern Arizona, Utah, and Nevada; the Northwest, or Montana and Idaho, with Oregon and Washington east of the Cascade range; also California and Southern Arizona, and the valley of the Rio Grande.

AGRICULTURAL EXPERIMENT STATIONS AND OFFICE OF EXPERIMENT STATIONS.

The Office of Experiment Stations serves to connect the agricultural experiment stations in the several States and Territories with each other and with this Department, to bring to them the fruits of accumulated experience, to indicate lines of inquiry, to assist them in co-operative effort and in research, to co-ordinate their work, and to collate and publish the results.

During the past year the work of the office has included correspondence; visiting stations; attendance on farmers' meetings and conventions of college and station officers; the collecting and indexing of station and other literature; the collection of statistics, and the promotion of co-operation among the stations. A most important part of its business has been the preparation of publications, including a record of the current publications of the stations and of this Department; the proceedings of the Convention of the Association of American Agricultural Colleges and Experiment Stations; organization lists of the stations and colleges; circulars and letters of inquiry and information on topics relating to station work; and, finally, Farmers' Bulletins.

The correspondence of the office is large and has doubled in the past year. It relates not only to the scientific, administrative, and general interests of the stations, but also to numerous and varied problems in agricultural science and practice, and extends to all parts of the world.

The increase in the amount and improvement in the quality of the

work of the stations and the establishment of new ones have caused corresponding increase in their publications. The editorial work of the office is consequently enlarged, and the Experiment Station Record for 1890-'91 will include twelve numbers instead of six, as in the previous volume. The Record, with its index, makes it easy to ascertain what the stations are doing in any given line of investigation, what are the main results, and where the published details are to be found. It will thus be increasingly valuable. Further provision for collating and disseminating information is made in the Digest of Station Reports and other technical publications of the office.

Each station distributes its own publications freely in its own State, but can send very few outside, although the results reported would often be equally useful in other States. To provide for the general distribution of such information to the farmers of the whole country, a series of inexpensive popular bulletins has been planned. Of the first of these an edition of 50,000 was speedily exhausted, and its statements were widely quoted by the agricultural press. A second bulletin illustrated the results of inquiries pertaining to topics of practical interest. An edition of 150,000 was issued, of which 75,000 were distributed through members of Congress. The nature of these publications led to the name "Farmers' Bulletins." The work and connections of the office are such as to bring to its attention a great amount of information of the highest value to the farmer, and I earnestly hope that the printing fund of the Department may be so enlarged as to enable these popular publications to appear more frequently and in larger numbers than heretofore.

One direction in which the sphere of the office should be enlarged is the collating of the fruits of agricultural inquiry in Europe, where during the past forty years numerous experiment stations and kindred institutions have been studying the laws that underlie the right practice of farming, with results that are constantly increasing in volume and value. Our station workers need this information to enable them to avoid going over old ground and making old mistakes and to suggest to them the most advantageous methods and lines of research. The Department needs it for its own investigations and to enable it to give to the stations the advice and assistance which they desire. So urgent is the need, that this work must be undertaken at once; but, in order that it may be carried on effectively and with sufficient thoroughness, an addition to the appropriation for the office is imperatively demanded. Well done, this work would save years of experimental investigations in this country; without it, the loss of labor, of money, and of needed information will be great.

Plans have been suggested and are under consideration for co-operative investigations on the soils of the country; fertilizers; sugar-beet culture; dairying; foods and feeding stuffs; the improvement of native grasses, forage plants, and wild fruits; and the introduction and ac-

climatization of new economic plants, the successful culture of which will substitute home-grown for foreign products. For the most advantageous carrying out of these plans there is need of more frequent visiting of the stations by the representatives of this Department, especially of this branch of it, and of the occasional calling to Washington of the directors and leading workers of the stations for consultation.

A review of the work and condition of the experiment station enterprise in the United States is, on the whole, decidedly encouraging. During the past year eight new stations have been established, viz., in North and Southeast Alabama, Arizona, South California, New Mexico, North Dakota, Utah, and Washington. Experiment stations are now in operation under the act of Congress approved March 2, 1887, in all the States and Territories except Montana, Washington, Idaho, Wyoming, and Oklahoma. In several States the United States grant is divided, so that 52 stations in 43 States and Territories are receiving money from the United States Treasury. In several States, branch or substations have been established. If these be included, the number of stations is 70.

These stations with this office expend in all about \$785,000 per annum, of which \$660,000 is appropriated from the National Treasury. They employ over four hundred persons in the work of inquiry and are conducting a large amount of research in the laboratory and greenhouse, and of practical experimenting in the field, the orchard, the stable, and the dairy. During the past year the stations have published about 300 reports and bulletins, aggregating about 10,000 printed pages. At a low estimate 3,000 copies of each of these publications have been distributed, making a total of 30,000,000 of pages, containing information on agricultural topics, directly disseminated among the people by the stations during one year, and thousands of newspapers and other periodicals have quoted from these publications the results, and, to some extent, the processes of the experiments described. It is believed that no means for popularizing the teachings of scientific research has yet been devised which in scope and far-reaching effectiveness surpasses this for the diffusion of agricultural science.

A marked feature of the enterprise is the close relation already established between the stations and the farmers. In many of the States members of the station staffs have been either organizers of farmers' institutes or among the foremost workers in them. The calls upon the station officers for public addresses are numerous and increasing. The station correspondence with farmers is very large, and touches almost every topic connected with farm theory and practice. Moreover, the results worked out by the stations are applied and enlarged by farmers who conduct trials upon their own farms on plans indicated by the stations, and the proof thus brought of the capacity of our intelligent farmers for experimenting is most gratifying. In short, the station and the farmer are working together and to the advantage of all concerned.

Another encouraging fact is the aid given the stations by State legislatures, local communities, agricultural associations, and private individuals. From these sources the stations have received during the past year about \$125,000 in money in addition to other gifts of land, buildings, and equipment. This indicates that the generous policy pursued by the general government is acting already in the case of the stations, as it has done for a longer time in that of the land-grant colleges, as a proper stimulus to generosity on the part of the States, communities, and individuals, and that on the foundations laid by the general government are to be built large and strong institutions.

The union with the agricultural colleges by which the stations have secured the advantages arising from the use of libraries and laboratories, and from connection with specialists, teachers, and students; the influences exerted by the Association of American Agricultural Colleges and Experiment Stations, and, finally, the earnestness and enthusiasm of the station workers, all conspire to give the promise of constantly increasing usefulness.

DIVISION OF RECORDS AND EDITING.

While this division, like several others, was actually called into existence last July, when the act of appropriation which included a provision therefor became a law, the work was practically done under another division in such a manner as to necessitate no reorganization of the work when it became an independent division. For convenience it will therefore be referred to in this report as a division, even with regard to the work done before it was properly raised to that dignity.

Since my last report this division has transmitted to the Public Printer the manuscript for eighty bulletins, besides supervising the printing of the Annual Report of the Department. With reference to the majority of these bulletins it has also prepared the usual synopses on the plan indicated in my last report, whereby as was anticipated the circulation of the bulletins has not only been greatly increased, but it has been effected far more promptly than was usual heretofore. The advantage of prompt distribution is especially appreciable in regard to the bulletins of this Department, relating as they do to the practical work of agriculture, which itself depends upon times and seasons with such regularity that delay in the distribution of a bulletin of a few weeks or even a few days in some cases may render it unavailable to the farmer for practical use until another season. An effort has been made to exercise greater discrimination in the distribution of bulletins, by which those relating to particular branches of agriculture should reach only those engaged therein. A great waste of bulletins has thus been avoided, and the circle of those who are benefited by the Department bulletins has been enlarged in far greater proportion than the number of copies distributed.

The work of publication of the Department has been much aided by the establishment of the division. Indeed, this work has attained such proportions that it is eminently desirable that there should be one office serving as the channel of all communications between this Department and the Public Printer, and the result has, I believe, been as satisfactory to that official as to ourselves. It is only just that I should here give due credit to the efficient management of the present incumbent of that office for results which have given us during the last twelve months, at an expense slightly less than that of the twelve months previous, publications aggregating in number of copies 1,133,000, as against 566,000 for the twelve months previous. At the same time a due share of the credit for the excellent results and good administration of our printing fund during the past twelve months belongs to the new division. In spite, however, of these advantages, I regret deeply to have to report that for want of a sufficient printing fund useful publications have had to be unduly postponed, while some have had to be abandoned altogether. The amount at the disposal of the Department for the previous fiscal year was \$39,235.45, a sum even less than that of the year preceding, which was \$40,914.37, and both these years this amount was secured only by obtaining a deficiency appropriation. Notwithstanding the immense increase in the number of divisions over two years ago and the fact that the accumulated experience and efficiency of divisions long established increase the number of publications, the appropriation for the current year is only \$40,000, a sum less than that expended two years ago.

The measure of the efficiency of the Department of Agriculture is largely its ability to supply practical, useful information to the public, and I can not but deplore in the strongest manner any policy which shall weaken the power of the Department for good in this its most useful field of labor, because that which is essential to the practical results of every other. To concentrate the time and ability of the chiefs of the several divisions and their assistants upon the investigation of problems with which our farmers have to contend, and when practical results have been obtained to withhold the means of making them public for the benefit of those whom the Department is created to serve, seems to reach the heights of unwisdom.

With regard to the publication work of the future, I have found that it will be necessary to divide the publications of the Department into three classes. The scientific work of the several divisions, for obvious reasons, must be recorded in a form available to the scientist and to the student. Even where no practical results are immediately obtained, the work done is so much accomplished on the way toward them, and the preservation of a record thereof for future reference will save to us needless repetition. Limited editions, therefore, of a series intended to serve as a technical record of the scientific work of the several divisions are needed. A second series, in the form of special bulletins contain-

ing the results of investigations and information of value to specialists in agriculture, to be issued in editions considerably larger, must be undertaken for the benefit of those who, without being scientific in any sense of the word, are engaged in some practical department of agricultural work, such as horticulture, dairying, stock raising, etc. In addition to these two series, we have found it desirable to cause the publication from time to time of short practical tracts, inexpensive in form, devoted to some special feature of agricultural work calling for clear, concise instructions, within the comprehension of any person able to read them, and available for immediate distribution in some particular section or to some particular class. The circulation of these bulletins must vary according to the demands of the occasion.

Again, as in the case of this class of bulletins issued through the Office of Experiment Stations, Farmers' Bulletins 1 and 2, it is desired to give in the plainest possible manner the gist of experimental research throughout the country on some one or other of the many important agricultural problems which it is the province of the stations to investigate and solve. To fully cover the field of publication to the extent which I deem absolutely essential to this Department, I have been obliged to name the sum of \$60,000 as the minimum amount necessary to carry out my purpose. In this connection I will only add that it is not only unsatisfactory, but seriously prejudicial to the efficiency of the work, to be compelled year after year to formulate plans of publication on an insufficient appropriation, trusting to a deficiency appropriation to supplement it. Many of our publications need six months' careful preparation, and, as I have already pointed out, delay in publication when a bulletin is ready often means a loss of one year's time to the farmers of the country.

DIVISION OF ILLUSTRATIONS.

Considerations in some degree analogous to those which led me to establish a division of records and editing led to my organizing the work of illustrations as a separate division, which, under the competent direction of a single chief, should include all the draughtsmen and engravers employed in the Department. These have been heretofore scattered here and there among the several divisions, and I concluded that better results would follow from the performance of all the work of this character under the direct supervision of a competent artist. Moreover, I am well satisfied that a considerable saving will be effected in the expensive work of illustration by the existence of an officer charged with responsibility for supervising this branch of the work for all the divisions of the Department, thus affording to the chiefs of the several divisions an associate whom they should consult in reference to all contemplated work of this character. The work of this division has been, as it were, but just begun under the new order of things, even suffi-

cient room having been lacking at the time the division was created; and this room has only just been provided, although I regret to say the accommodations, for reasons which I have sufficiently amplified when dealing with the question of the buildings, are far from adequate for the work required of it.

SEED DIVISION.

The distribution of seeds for the year ending June 30, 1890, exceeded in number of packages that of any in former years, although the appropriation for that purpose was the same as that granted in years immediately preceding. This was due to a radical change made in the method of purchasing seeds, and to which allusion was made in my last report, namely, the employment of a special agent, whose sole duty it is to visit personally different sections of the country and inspect, as far as possible, the product of the seeds offered to the Department and to look up such as seem to possess especially desirable characteristics. The result has been so satisfactory that, with an expenditure of money for the purchase of seeds no greater than that of the previous year, the number of packages of seed distributed has exceeded that of the previous year by three quarters of a million, the fact being that the total amount of seed distributed by this Department during the last fiscal year would, at the prices paid during the previous year, have cost the Department \$18,000 more than it has. An earnest effort has been made to introduce new and important varieties of seeds, many having been secured for that purpose in foreign countries. I may refer especially in this connection to the Ladoga wheat, Bermuda grass-seed, and the sugar-beet seed.

I have also continued and enlarged the distribution of seed to State experiment stations, these institutions having obviously the best facilities for giving the seeds a thorough trial and for making such reports regarding the same to the Department as will enable us to arrive at just conclusions as to the adaptability of the seeds to our climate and soil, as to the best methods of cultivation, etc., thus enabling us to accompany further distribution, if such be decided upon, with intelligent and reliable instructions.

DIVISION OF GARDENS AND GROUNDS.

This division is charged with the care of the grounds and conservatories surrounding and attached to the Department buildings. The grounds include some 40 acres, with roadways, walks, trees, etc., to be looked after and kept in order; and in the conservatories and propagating houses are conducted the propagation and culture of economic plants. The distribution of these plants throughout the country, with due regard of course to the climatic conditions favorable to their growth, devolves upon the Superintendent.

The conservatory attached to the Department is a common resort of visitors to the national capital, and I have been impressed with the fact that its educational features have not been as complete as it seems to me is desirable. These conservatories are not only among the finest in the country, but the plants they contain having been selected according to a special design and embracing a very large variety not only of the ornamental, but especially of the economically useful varieties, much useful instruction would result to visitors by the preparation for free distribution of a carefully prepared catalogue, provided with reference numbers and a plan of the greenhouses, so that the several plants could be readily identified. As so large a portion of the conservatories is devoted to plants of economic value, this catalogue should be sufficiently full to explain the value of each plant, as well as the method of cultivation and of the preparation of the commercial product. I have accordingly made arrangements for the preparation of such a catalogue, and am quite satisfied that when completed the work will not only reflect credit upon the Superintendent of Gardens and Grounds to whom it is intrusted, but will be found of great interest and value to visitors to the conservatories; indeed, it will no doubt have the effect of greatly increasing the number of visitors, especially of those whom it should be the object of all public institutions to serve in a particular manner. I refer to young people in attendance upon our educational institutions.

The plants distributed through this division during the past fiscal year amounted to over 80,000, and included olives, tea, coffee, camphor, strawberries, grapes both native and foreign, citrus of many species, raspberries, date palms, figs, Japan persimmons, currants, loquats, guavas, pineapples, black pepper, vanilla, mangoes, and bananas. Reports as to the results obtained with the plants so distributed are encouraging. The culture of the olive is fairly established on the Pacific coast, and it seems likely that it can be profitably established on the Atlantic coast as well, the tree being well adapted to the climates over a wide range in the Southern States. With this end in view, the Department recently imported some of the best selected varieties, which are now being propagated for eventual distribution in suitable localities. There were also distributed some 10,000 cuttings of Smyrna figs of carefully selected varieties, such as furnish the dried figs of commerce.

At present the camphor tree is found well adapted as a shade tree in Florida, where suitable shade trees are a matter of special interest, and many plants have been sent into that State during the past ten years. It is hoped that at some time the plant may be profitably utilized for its commercial products. With the increased demand for camphor, it is believed that the prices for the article would warrant an extension of the plant in some of the Southern States. It has been proved to withstand the climate of the Atlantic coast as far north as Charleston, S. C. It is a hardier tree than the orange, probably nearly as hardy as

the olive. To enable those who may desire to experiment with the tree, a quantity of plants will be propagated sufficient for a generous distribution in the near future.

The black pepper, vanilla, cinchona, and the cocoa (*Erythroxylon coca*) are being propagated and have been distributed to some extent. Their success is as yet somewhat problematical, but is possible in some situations in Southern Florida, where these plants may obtain permanent foothold.

The importance of this work in the general encouragement of the growth of useful and economic plants is shown by the large amount of imports of fruits, nuts, spices, and vegetable products, which could certainly be much reduced were the cultivation of these plants undertaken, if only in those limited localities where they can be cultivated with assurance of success.

THE WEATHER BUREAU.

Under an act approved October 1, 1890, Congress directed "that the civilian duties now performed by the Signal Corps of the Army shall hereafter devolve upon a bureau to be known as the Weather Bureau, which, on and after July 1, 1891, shall be established in and attached to the Department of Agriculture."

In accordance with this act I have included estimates for the ensuing fiscal year for carrying on the work of the Bureau thus created in this Department. I deem it evident from the discussion which attended the passage of this act, and from the wording of the act itself, that in making this transfer of the Weather Bureau to this Department, it was the intention of Congress that the work of the Bureau should be extended, in so far as might be necessary to a full co-operation of this branch of the service with the work of the several divisions already established in this Department for the benefit of agriculture, without in any way restricting its general scope. In this spirit I have submitted estimates for the coming year on the basis of the wider range of work thus contemplated, and I take the opportunity of expressing here my own conviction that in many ways the work of meteorological observation which this Department will be thus enabled to carry on in conjunction with its other work, will be found of great value to the farming interests of the country. It is indeed self-evident that to complete the study of soil conditions, of animal and plant life, a study of the climatic conditions of our country is indispensable.

REPRESENTATION OF THE DEPARTMENT AT FAIRS, ETC.

In my last report I referred to the fact that there are held in this country annually a vast number of fairs—usually a State or Territorial fair in every State and Territory in the Union, many other large district or interstate fairs, while county fairs are very nearly as numerous as

the number of counties in the whole country. It is a very essential part of the duty of this Department to keep itself well-informed in regard to the extent and character of the agricultural resources of all sections of the country, and I know of no opportunity for adding materially to this information at so slight an expense of time and money as is afforded by these exhibitions which bring together in one place samples of all the best that the country can produce.

It is my desire that the representatives of this Department should be found hereafter at all the principal State fairs, under instructions to make a thorough report on the character of the exhibits, and at the same time to avail themselves of meeting, as they will do on such occasions, the leading representatives of agricultural interests, from whom much can be learned as to the wants of the farmers, the nature of their difficulties, and the best manner in which the Department can serve them. Furthermore, I desire to carry this system of representation at the fairs as far as possible, even to include county fairs, by availing myself of the co-operation of the large staff of voluntary correspondents of the Department distributed through all sections of the country, and to whose enthusiastic devotion to the cause of agriculture the Department has already been often and much indebted. It seems to me that by such means a sort of bird's-eye view, as it were, might be obtained of the agricultural resources of the country, with the result of supplying this Department with a vast amount of valuable information which can not only not be secured so easily in any other way, but indeed can not be secured at all except by these means.

Among other services which these representatives could render the Department would be the collection and forwarding to the Department museum samples of the various exhibits which at present are too frequently scattered and lost. This subject naturally leads to a consideration of the necessity for a more frequent interchange of thought between this Department and the agricultural intelligence of the country. I called attention in my last report to the fact that there had been, especially in the past few years in the United States, an enormous development in the agricultural organizations devoted to the farmers' self-improvement. Our dairy associations, our horticultural, live-stock, and kindred societies, have not only multiplied as to number, but to-day are far more active in holding meetings and conventions than they have ever been before. The farmers' institutes are meetings of a general character, attended usually by the best farmers in the sections in which they are held, and bringing together the best agricultural thought and practice. Not only do I deem it to be of the utmost importance, indeed a solemn duty devolving upon this Department, that these meetings and gatherings should be encouraged in every possible way by their representative Department in the national government, but I conceive it to be absolutely necessary for the intelligent conduct of the work of this Department that it should be frequently

represented at such meetings, not only for the encouragement and benefit of those present, but for the benefit of this Department and its division chiefs.

Speaking from my own experience, I am aware that in the large section of country with which I am familiar, from an agricultural standpoint, most important meetings have been held in recent years. Questions of the gravest import to the agriculture of this country have been discussed at these meetings, and yet rarely indeed has there been present any person representing the National Department of Agriculture who could speak for it, and what is still more important, learn for it the views and wants of these people. This is a condition of affairs which calls for immediate remedy, and in so far as the liberality of Congress will enable me to do so, I am determined to provide that remedy. It is only by the closest co-operation between this Department and the agricultural societies—the Granges, the Alliances, etc.,—that the work of the Department can be carried to its highest development and attain its greatest usefulness, and I recommend that a special fund be placed at my disposal for this purpose.

COLUMBIAN WORLD'S FAIR.

The act of Congress approved April 25, 1890, gave national assent to and recognition of the proposition to hold a World's Columbian Exposition in the city of Chicago in the year 1893. The bill provides that there shall be prepared a governmental exhibit. For the purpose of securing harmony of installation and arrangement, it was provided that a board consisting of persons to be designated, one each by the head of each Department, should be formed. In compliance with this law I designated the Hon. Edwin Willits, Assistant Secretary of Agriculture, as representative of this Department upon the board, and you ratified this nomination and designated him as its chairman. Mr. Willits informs me that doubt upon the part of the accounting officers of the Treasury has already been expressed as to the availability of the funds appropriated by Congress for the work in hand, and at this writing we have an intimation that nothing can be purchased, nothing constructed, nothing exhibited which is not now in the Departments, and that no outside assistance can be employed in any branch of the work of preparation.

In so far as the Agricultural Department is concerned, I say without reservation, it were better to abandon the attempt to make any exhibit than to undertake the task with such limitations. It certainly is not my intention to enter the exposition field in competition with the private, State, or corporate exhibitor, but beyond this field there lies a wide region wherein this Department may operate in illustrating those functions which are peculiarly its own. This Department is instinct with science. A process can not be fully illustrated on a printed page, and this exposition furnishes a rare opportunity, which hardly comes

twice in a lifetime, to supplement the publications, at present its only means of communicating with the public, by a spectacular exhibition of current methods of dealing with agricultural problems and processes. If the work devolving upon this Department in connection with this exposition is to be undertaken at all, it must be in such a manner as to guarantee satisfactory results; and in its performance we must be left at liberty to avail ourselves of such material and such expert assistance as we can find adapted to the purpose. I commend the subject to your attention in the hope that any obstacles to effective work now existing may be removed by Congress, and that the work may proceed without delay.

THE MUSEUM.

The needs of the Museum have continued to receive my most thoughtful attention. A marked improvement in the appearance of the exhibit has been effected by its re-arrangement and renovation; and plans have been perfected by which, it is believed, the aid recently granted by Congress will be applied to the best possible advantage. The educational, scientific, and historical interests which would be promoted by a distinctly agricultural museum of suitable character are too generally recognized to need urging at this time. It should be a matter of regret, however, that for the thousands who annually visit us from abroad, impressed in advance with the magnitude and diversity of our agricultural productions, we should have no permanent national collection fitly illustrating the products of our soil. The need of such a collection, moreover, is being keenly felt in investigations prosecuted by this Department, and involving important economic questions, the solution of which could be materially facilitated and hastened by access to the actual results of cereal growth attained under various conditions of soil, climate, and culture. I deem it a fitting time to suggest that proper foresight on the part of Congress should secure for this Department, after their exhibition at the Columbian Exposition, such available articles relating to the operations of agriculture as shall be worthy of place in a permanent exhibit; and that in the meantime suitable provision be made for the accommodation of the present collection and subsequent accessions.

ADEQUATE BUILDING FACILITIES.

A consideration of the wants of the Museum brings me to the question of adequate building facilities. The want of these is conspicuously illustrated by the unavoidable utilization of a huge, unsightly wooden structure, far inferior to many an exhibition building on a country fair ground, as an agricultural museum; furthermore, the building being made to do service on occasion as a general storage warehouse, and to accommodate not only the silk filature and cocooneries, but a number of offices for which I need hardly say it is most illy adapted. Moreover its use for this purpose necessitates dividing the force of several

divisions, one part of the force being at work in one building and another part in another, a condition of things which is found a serious impediment in carrying on the work. All the more important divisions are suffering grave inconvenience, and important work is unavoidably delayed owing to this condition of things; in fact, a vast amount of time and pains, which might have been profitably devoted to more important work, has to be unavoidably spent in devising ways and means to overcome, or at least to mitigate, the embarrassment and annoyances, amounting to serious obstruction to the work of the Department, entailed by this want of room.

I must therefore renew in the most energetic manner my earnest recommendation that immediate steps be taken to provide this Department with an additional building, suitable for the accommodation of all the laboratory work of the Department, and at the same time of a number of the offices, as well as with fireproof accommodations for the reception of the valuable herbarium and other property of the Department, which it has cost years of labor and large sums of money to accumulate, and which, if they should ever be destroyed, no amount of time and no amount of money could possibly replace.

PROMOTION OF CORN CONSUMPTION IN EUROPE.

I have long been impressed with the necessity of taking measures to promote the consumption of Indian corn in foreign countries. The facility with which we can raise this cereal, its generally low price, and the occasional glut in the home market in years when the yield has been especially large, make an increase in our exports of corn extremely desirable. It is essentially an American cereal, one which can be grown in all parts of this great country, and the area adapted to which is practically illimitable. Not more than 20 per cent. of the crop on an average is moved outside of the county in which it is grown, and to the extent to which this indicates the utilization of the crop for feeding purposes on the farms where it is grown this is well; but when we realize that this fact is due in part at least, especially in years like the last of an ample yield, to the absolute want of demand, our home markets being fully supplied, it is certainly a matter of profound regret that there does not exist a foreign demand sufficient to relieve the glut at home, and to secure for our farmers in the West a price which would be adequate at least to save them from loss on the growing of the crop.

During the past ten years our exports have hardly exceeded 3 or 4 per cent. of the total crop. This is due largely to the fact that corn is utilized throughout the greater portion of Europe solely as food for animals, and then only when its very low price tempts the feeders. As a food for human beings it is practically unknown, save in some sections of Southern Europe, while in the greater part of that continent it can not even be grown to maturity. I have recently determined to

avail myself of the presence in Europe of Col. Charles J. Murphy, a well-known authority and enthusiast on the subject of the increase of our corn export, who has been commissioned by me to make a report to this Department upon the general subject of the promotion of the use of Indian corn as a human food in European countries. Colonel Murphy's report will be made the subject of a special bulletin as soon as it shall have been received, and will no doubt treat of this important subject practically and well.

REPRESENTATION OF THE DEPARTMENT ABROAD.

I desire to record here very emphatically my conviction that some method must be adopted by which, as occasion requires and without long delays, this Department shall be enabled to send representatives to foreign countries in cases where only personal visits can be relied on to secure much-needed information. The subject of world-wide competition has been dwelt upon at length on so many occasions that it would be purely superfluous to insist here upon the active competition which meets our own farmers in every market where their products are offered for sale. The commercial side of this condition of things is well understood, but it does not seem to be so clearly understood or so well appreciated that there is an intellectual competition which is even more serious than the other, in that it is the basis of the other.

Where wise economic legislation is the cure, the perfection of agricultural methods, which means the maximum of production at the minimum of cost, is the prevention of agricultural troubles. In our pursuit after this perfection we must study the methods of all other countries that attain or approach it in any branch of agriculture. We must be prepared to learn all that is to be learned elsewhere, and then wisely adapt the information so obtained to the conditions of the American farmer. Consequently that information must be acquired by men who are themselves familiar with our own agricultural conditions. This plan, except in so far as it is now offered on behalf of agriculture, is by no means a new or original one. It is but a few years since that a commission of distinguished military officers visited many of the European countries and British India for the purpose of studying the equipment of foreign armies with a view of adapting to our own military service all that might seem to be advantageous. I have understood that the report brought back by these gentlemen was regarded by high authorities as most valuable. In this, as in many other respects, agriculture has not had the fair treatment which, in spite of the fact that it is beyond dispute the most important industry in the country, is, after all, all that it asks for. The suggestion of sending a well-qualified representative abroad purely in the interest of agriculture is cavilled at as a means of affording a pleasure trip to some broken-down professor. It is time that we rose superior to such humiliating and unworthy puerility.

It may be well, perhaps, in this connection to call attention to the fact that we are in this respect far behind the other nations of the world, however disagreeable it may be to confess it. Important gatherings of men devoted to agricultural science, and enjoying by the courtesy of the government under whose jurisdiction they assemble every privilege and facility for gaining information in regard to the agriculture of that country, are constantly being held in various parts of the world, at which representatives of this, the greatest agricultural country in the world, are conspicuous by their absence; and when we are represented, it is often by some wealthy amateur enjoying his ease abroad, or, as is sometimes the case, by some enthusiast, who, at a sacrifice of time and money which he can ill afford to spare, manages to attend; but officially this country and this Department are very rarely represented on such occasions. A most notable instance of our omissions in this respect was furnished during the meeting last September of an international agricultural congress at Vienna, in which we had been especially invited to participate by the Austro-Hungarian Government, at which over eleven hundred delegates were present, including distinguished representatives of agricultural interests from every country in Europe, from Japan, from Australia, from India, and from South America, and at which were discussed subjects of profound interest to American agriculture. This was a meeting at which, for many reasons, it was most desirable that the United States, through this Department, should have been officially represented. Unfortunately, for want of adequate provision, the United States alone, of all the leading countries of the world, was absent.

Let me here recall the fact that since I had the honor to assume the office of Secretary of Agriculture I have been visited by gentlemen from Austro-Hungary, Germany, Bavaria, France, Great Britain, Canada, Australia, New Zealand, Japan, and even from one of the native principalities of the East Indies, the official representatives of departments analogous to my own in their native countries, traveling under orders from and under the pay of their respective governments, armed with all the official credentials necessary to secure to them every attention and courtesy necessary to the prosecution of their inquiries. Thus do these countries indicate their willingness to learn whatever we may be able to teach them. Thus do they recognize the fact upon which I have already insisted—that there is an intellectual as well as a commercial competition, to which the old maxim, “Knowledge is power,” applies with a force which all must recognize.

In concluding this my second annual report as Secretary of Agriculture, I feel amply justified in expressing my general satisfaction at the condition of agricultural matters in our country. It is true that in many cases the effects of former agricultural depression are still felt, and it is also true that in a vast country like ours there must be at all

times more or less depression existing in some section or another and affecting some local interests. Nevertheless, a careful review of the events of the past year and a general survey of the agricultural field to-day betoken marked improvement in the condition of our agriculturists and promise well for their future well-being.

The recognition of agricultural interests in recent national legislation will have the double effect of assuring the farmers of the appreciation of their wants as a class by our public men and of securing to them many beneficial results in the near future. I have also had frequent opportunities of noting with sincere gratification the rapidly growing tendency of our farmers to avail themselves of the work of this Department in its many branches and their constant thirst for more information, not only in regard to the statistics of agriculture, but as to the scientific principles which all are now beginning to recognize as lying at the very foundation of successful agricultural work. That the means for imparting this information exist in this country through the liberality of the national government on a scale far beyond any that has been attempted in any other country under the sun, is a fact which all must gratefully acknowledge, while this very fact, coupled with the earnest demands for increasing information, it must not be forgotten, adds largely to the burden of responsibility imposed upon this Department and its officers, upon the national legislature which is responsible for providing it with the means necessary to enable it to satisfy these constantly increasing demands for information and advice, and upon these numerous institutions scattered throughout the country and specially endowed from the national treasury to labor for the benefit of agriculture.

Much indeed has been done for agriculture in this country. Much more remains yet to be done; but, relying upon the results of an earnest co-operation on the part of all the great forces which I have indicated as at work in this behalf, and confident of the cordial support of the people of the United States in all steps taken by the national government to further the interests of that great foundation industry of agriculture, upon which the future prosperity of the country so essentially depends, I look forward with courage to the work that lies before us in the future and with confidence to the time when, in the high quality of its work as well as in the magnitude of its enterprise, the agriculture of the United States shall not only lead all other industries in this country, but shall be the leader in this great industry of all other countries.

In the hope that together with the people of the United States you may be led to the same encouraging conviction by a consideration of this report, I have the honor to respectfully submit the same.

Very respectfully your obedient servant,

J. M. RUSK,
Secretary.

PAPERS

ACCOMPANYING

THE REPORT OF SECRETARY OF AGRICULTURE.

REPORT OF THE ASSISTANT SECRETARY.

THE SCIENTIFIC WORK OF THE DEPARTMENT IN ITS RELATIONS TO PRACTICAL AGRICULTURE.

Agriculture to be permanently successful must be founded on and conducted according to scientific principle. As all legislation not in accordance with fundamental economic laws will sooner or later fail in its beneficent purpose, so agriculture without an intelligent apprehension of its conditions and limitations, without a wise consideration of the laws to which it is subject, without a proper application of every means to enhance its productiveness, will ultimately fail to respond to expectations and will bring disaster to the farmer. Nature can not be cheated, and her implacable laws will surely find out their transgressors. There is a plague-stricken soil as well as a plague-stricken population. Sanitation and vegetation are not accidents; for both there are arts that promote and arts that prevent injury. Science is at the bottom of each.

Science is classified knowledge. This knowledge comes from experience and from investigation. It is as important to know what has been done as to know what it is possible to do. Science arranges the facts of the former in line and finds a law; or it investigates, projects itself into the unknown, and discovers other laws or amplifies those already known. Men who heed these laws avoid mistakes, conserve their energies, and double production.

The practical farmer too often forgets or ignores what he owes to science. He perhaps is sometimes not aware of the obligation. How many farmers, for instance in the temperate zone, would be moved to build a monument to the man or men who invented hay as adapted to modern use? Yet in a large sense hay is a modern discovery, based upon long experiments made in the importation, cultivation, and improvement of grasses till then unknown to the agriculturist. As recently as the sixteenth century the average weight of the bullocks bought for the English navy was less than 400 pounds. For want of hay the sheep were mostly killed in November, and such as were left were, with the oxen, starved through the winter so that improvement was impossible. The grass experiments, scientific and practical, of the Duke of Bedford and others, made the 2,000-pound bullock possible, by furnishing food for continuous unstinted growth, winter and summer, from birth to maturity. It was by no accident that the few useful grasses upon which are based

the live stock and dairy interests in the magnificent proportions of the present time were brought from diverse countries and made subservient to the interests of mankind.

How long it took the world to learn that proper rotation of crops "rests the land" as effectually as fallowing, thereby saving one crop and sometimes two a year; to learn that the increase of live stock on the farm within and under certain conditions increases the fertility; to learn that artificial drainage warms and lightens cold and heavy soils, advancing the harvest by weeks and bringing the subsoil to the relief of the impoverished surface, by which as some one has said we find a new farm under the old one, or as Emerson so graphically says, "by drainage we have gone to the subsoil, and we have a Concord under Concord, a Middlesex under Middlesex, and a basement story of Massachusetts more valuable than the superstructure." These matters were all demonstrated by the application of scientific principles long before adoption by the world at large.

It is perhaps a waste of words to continue a further discussion of what agriculture owes to science. Illustrations multiply as the ever-widening field is traversed. Suffice it to say that to the introduction of scientific methods and processes is due in large measure the elevation of those who till the soil to their present high estate. Science carries intelligence with it wherever it goes, and its wains are freighted with the burdens of increased harvests. In line with this sentiment and in furtherance of the demand of the farmers of the United States, was founded

THE DEPARTMENT OF AGRICULTURE.

As far back as 1822 a strong effort was made to transform the "Mall," some 200 acres, between the Capitol and Executive Mansion, then almost a barren waste, into an experiment farm, in which should be propagated for distribution new and rare seeds and plants. Nothing came of the agitation in that form, but in due time a division was established in the Patent Office to gather facts and disseminate information for the benefit of agriculture, and after a while to purchase new and rare seeds and plants in limited quantities for gratuitous distribution. The demand for better things grew till finally a separate and independent department was set up on 40 acres of the "Mall" which forty and more years before was sought for an experiment farm. With this transfer came enlarged powers and duties. In accord with enlightened progress the means were given for original scientific investigation. Several new divisions were created for that purpose, among which chemistry was chief. Since then, from time to time, other lines of inquiry have been added till there is hardly a topic of investigation relating to agriculture, suggested by modern thought, that is not in greater or less degree covered by the work of the Department. Its halls are instinct with science. The chiefs of the divisions and many of their subordinates are eminent in their special lines, and are recognized for their work and their ability the world over as the peers of any like body of investigators, seek where you may.

One of the gratifying features of this development in scientific research is that the practical character of the work has not one whit abated. Much more than one-half of the money appropriated is used for the gathering of facts and statistics, for the purchase and distribution of seeds and plants, for the extirpation of contagious

diseases of animals, for the introduction of and experiments with forage plants, for the inspection of meats and animals intended for export, and finally, for the dissemination of information. The most abstruse scientific inquiry is tempered by a practical impulse. The best scientific work has for its end the useful and the permanent good of agriculture. Here is exemplified what history again and again shows, that the best and highest scientific work has always been allied with the useful. Men need to be harnessed to facts, theories need to be in touch with realities to produce the best results; truths substantially verified in our experience. At the same time the publications issued by the Department constitute a mass of information the most extensive and varied among the nations of the earth. The annual report, of 400,000 copies, constitutes the largest single edition of any book published. In their practical character, in their scientific worth, and in the promptness of their issue, our publications are the admiration of all representatives of foreign governments accredited to the Department to study its workings and efficiency.

So much it is thought is due to make it clear that in this development the cardinal purpose and duty of the Department is not lost sight of. It remains now to consider in detail the

SCIENTIFIC WORK OF THE DEPARTMENT.

This work may be properly divided into three classes: (1) The experimental, (2) the remedial, and (3) general science.

As a matter of fact this classification is not made by divisions, but largely characterizes the work of all the divisions. The classification is generic, not divisional.

I.—THE EXPERIMENTAL.

This may be subdivided for more clear definition into (1) the empirical and (2) the economic.

The empirical.—This term empirical is used for the want of a better though not strictly accurate. By the term is meant that class of experiments which are not popularly considered scientific, though in fact based upon a scientific principle. This work is more fully carried on by the Seed Division, the Horticultural Division, the Pomological Division, and the Botanical Division.

The distribution of improved and valuable seeds and plants is sound policy, because based upon natural law. In a wide sense nature has made her own distribution which all experiments must recognize, and it is the study of the laws of this distribution that constitutes the scientific element of the empirical work, and which renders our definition not strictly accurate. For instance, it was practically a useless waste of funds to distribute cotton seed to the State of Michigan, which was done for a while under the ironclad appropriation that each Congressman should receive his quota of all seeds—an anomaly subsequently rectified. Climatic and other considerations (really scientific) should have their weight in the purchase and distribution. But, within comparatively certain lines, there is a wide field for improvement in quality and product, by the judicious introduction of new varieties and the transfer of valuable ones from one locality and condition to another.

While nature in the broad sense has placed her varieties of vegetable life in the regions to which they are best, and sometimes where they are exclusively adapted, there are some very marked exceptions. For instance, the potato, corn (maize), and tobacco were indigenous only on this continent. Their transfer to Europe has been an untold benefit to its teeming population. The transfer to England, in the seventeenth and eighteenth century, of some of the grasses indigenous in Virginia and Maryland, rendered it in large measure possible to make the hay in abundance, which has been noted near the beginning of this article, and which was the prime cause of the modern development of the cattle industry. The planting of the Eucalyptus tree, indigenous in Australia, has been a boon to treeless Southern California. We need not to be reminded that nearly all our cereals as well as our domestic animals are of European or Eastern origin. These illustrations cover broad lines, but they are sufficient to establish the fact that the securing of new seeds and plants for distribution is a paying investment properly conducted. On the other hand, it is equally as susceptible of demonstration that the distribution of valuable seeds and plants, not new, but well known, from one locality to another, is promotive of a higher and better production. Taken from a locality where they succeed at their best estate, they carry with them to their new home some of the impulse and vitality they took on where they were grown. This is nature's secret at the bottom of the benefits in "change of seed."

Recognizing these facts (based, as has been noted, on scientific reasons), Congress for nearly fifty years has appropriated funds for the purchase and distribution of new and valuable seeds and plants, and has committed the duty of carrying on the work to the Department of Agriculture. While it is conceded that many mistakes have been made and some notable failures have occurred, the fact remains indisputable that great benefits have been conferred upon the agriculture of the United States by the distribution. We can, out of many, give only a few illustrations. Take one from the Seed Division, that of the wheats sent out. Many kinds have been distributed. The most of them appear in the list of those now cultivated, but the number disseminated is of little importance compared with the prominence of some of them in the wheat growing of the present day. The variety which has the widest distribution is the "Fultz," a red winter wheat, which originated in Pennsylvania, and was distributed in 1871 and subsequent years. The area now occupied by it is four times as much as that devoted to any other wheat, and probably occupies one third of the area seeded in winter wheat, producing at least one fourth of the wheat harvest of the country. The next in extent is the "Mediterranean." This was imported by the Department twenty-five years ago and for several subsequent seasons from Marseilles, France, and grown on the islands of the Mediterranean Sea. The next was the "Fifa." It is almost as prominent among spring wheats in the proportion of its cultivation as is the Fultz in the domain of winter wheats. It is the great wheat of the Northwest, introduced by the Department. The next and fourth in importance is the "Clawson," so well known in Michigan. Many more might be mentioned, taking a lower rank, but which are leading varieties in many localities. The four named yield nearly or quite one half of our usual crop. Last year the Department distributed seven home varieties and four new imported

ones. The home varieties consisted of three new improved ones and four of more than local celebrity, to be transferred to the localities in which they were not grown. Of the four imported two were of Black Sea and Italian parentage, for our Southern States, and two of English and French parentage; all raised in and thoroughly acclimatized to France. It is hoped that out of the four we may find at least one substantial acquisition. They all may prove failures. That is the reason why the experiment is called empirical, having as it does a large element of chance in it, though careful study was made of the strain, of the varieties, and the conditions of production.

So much for the Seed Division, though illustrations too numerous for this article suggest themselves. Let us take one or two from the work of the Horticultural Division. This deals largely, of course, with plants. It first introduced the Russian apple, which has such rare success in the West and North. It introduced the Japan persimmon, which has become so largely cultivated in Florida and California. The celebrated Washington navel orange of California was propagated from a tree growing in the hothouse of this Department. Those who have seen this wonderful orange grow will concur in the statement one repeatedly hears in California, that the introduction of this one variety was worth more to the country than the total cost of the Department of Agriculture. The original plant came from Bahia, Brazil. It took three years and two failures before success was attained, and then only in rearing a single tree, from which has come such a progeny. We cannot stop to enumerate the catalogue of fruits and plants and fibers introduced, of the pineapple, olive and figs, dates and citron: We will stop, however, long enough to speak of the citrons and figs recently imported by the Pomological Division, and of the date palms from Egypt, just distributed in California and Arizona, and upon which great expectations hang.

The Botanical Division is specially charged with the experiments with the grasses and other forage plants. During the existence of the Department the Seed Division gave much attention to the distribution of grass seeds, but it is not till within the last two years that the thorough and exhaustive experiment has been assigned to a division which shall make it a specialty. It is believed that the era which was inaugurated by the English experimenters, heretofore noted, can be repeated; that they did not exhaust the subject; that new grasses and forage plants can be found that will successfully enlarge the list. Another reason for entering upon the work is that the results of the English experiment accrue only to a comparatively small portion of the United States. The conditions south of Virginia and Kentucky and west of the Missouri River are so different that the staple forage plants will not thrive in economic production. The South needs a new line of grasses as much as did England in the sixteenth century, and for substantially the same reason. The Great West, which is developing so rapidly, presents altogether another problem. All the grasses known to us in the North have been practically discarded there and others are supplanting them. The list is at present small, even under irrigation, and the hope is that it may be largely increased; while without irrigation there is as yet no known grass that will succeed under cultivation. Perhaps two thirds and more of that vast territory is not susceptible of irrigation. A considerable portion of this area is covered with native

grasses of limited production that close and continuous pastures destroys, leaving nothing in its place.

It is believed that from those native grasses, from those in Siberia, in India, and in South America, some varieties may be found that shall "stick" and thrive permanently, thereby quadrupling at least the production. It will doubtless take many years to accomplish this. It took England fifty years to develop her grass industry. Long before the expiration of half that time the advancing tide of population will utilize the results of these experiments, if successful, without in any sensible degree affecting the value of the products of the older and more thickly populated States. It is wise statesmanship to anticipate the wants of the future, and to determine how far it is practicable to make homes for the teeming millions to come. The Department of Agriculture is for the whole country, and should canvass the wants of all. The South, if these experiments prove a success, will find in them the means of restoring her sterile acres, and of preventing further depletion of her soil, and at the same time of developing an industry that shall make her more self-sustaining. The West may gradually force back the lines of the desert, and with grass to temper and forest trees to resist, may hope to modify the blizzards.

The economic.—This is the second branch of the experimental work. This characteristic may be found in all, but in a less degree than in the Chemical Division. The most marked feature of this division in this line is its work on the sugar question. This experiment and investigation is one of long standing. A large amount of work was done to determine whether there was sufficient saccharine matter in cornstalk to produce sugar with a profit. It was finally decided that there is not. Then, or in a measure concurrent with the corn experiments, began a long line of tests on sorghum; first, to determine the variety, the richest in saccharine qualities; second, to find the period of maturity productive of the largest yield, and at what stage of its growth the sugar would crystallize most readily, and with least loss in molasses. The cane upon which these tests were made was planted, cultivated, and gathered under the supervision of the division. Both objects were satisfactorily determined, and for a time it looked as though the general production of sugar from sorghum would prove a success, but the price of raw sugar in the market took a large decline, so great that sugar from sorghum could not be economically produced, resulting in the collapse of the new industry, as well as that of the manufacture of glucose, a bastard sugar with which the genuine was adulterated. The experiments continued, however, taking the form of improving cane by careful scientific cultivation and propagation, so that the yield of sugar might be increased, and in determining what localities, if any, were adapted to its economic production. Considerable success has attended the work. The quality of the cane has been sensibly improved, and the regions of highest production pretty well defined; but at this date the promise for a general sorghum-sugar industry does not equal the high hopes of its most sanguine promoters, though it promises to be a success in a restricted locality. The experiment, however, has proved a most valuable one, even where it has failed, worth all and more than its cost, in that it has been demonstrated that sugar in unlimited quantities at a price but little above the cost of foreign sugars can be manufactured, so that in case of national

emergency or scarcity abroad our country may be amply supplied with home products.

If the maxim "In time of peace prepare for war," is a good one in a military sense, it is no less so in an economic. A great deal of scientific work has been done in the analysis of the cane, in the study of all the processes of extracting the juice and its manufacture, in the improvement of the machinery and apparatus, in the elimination of waste by new methods and new processes, so that a full knowledge of the conditions and the possibilities of the industry has been obtained. These experiments have not been limited to sorghum cane, but have covered that of the sugar cane of Louisiana. With the latter the improvement is so marked that it is worthy of special note. The industry in Louisiana has been of so long standing that comparisons can be made. It has been proven that by modern processes developed with the cooperation of the division, and in many respects under its direct instruction, the yield of sugar from a given average ton of cane can be raised from 120 to 200 pounds, the difference of 80 pounds being lost in the operation conducted according to the old methods. When the new processes shall be applied by all the cane sugar producers, an increase of product in the area of present cultivation would be effected to the value of more than \$10,000,000 annually. These results from both the sorghum and the cane experiments amply justify the work and the expenditure. These experiments still continue, and in addition, under direction of Congress, the cultivation of the sugar beet, and the manufacture of sugar therefrom, have been taken up. A large amount of the best seed from Europe has been obtained and distributed in the localities supposed to be best adapted to their growth, and analyses of the beets from a wide region of country are being made. At this writing the most flattering hopes are excited from the showing made. The previous work done with sorghum and sugar cane makes the transition to the beet sugar inquiry an easy one, and its solution will be more rapid, intelligent, and satisfactory.

II.—THE REMEDIAL.

Vegetable and animal life are subject to similar conditions. A tree and an animal live essentially on the same elements. They both grow to maturity, and in due time die and decay. Both have their enemies and their diseases. There are diseased cattle and diseased vines. No one speaks of a diseased granite block. It is this life and its conditions, therefore, that has its enemies and its diseases. Anything that saps or stops nutrition is an enemy to life, and may be the cause of disease. Growth stopped, decay begins and death ensues. Kill the enemies, stay the disease, and life continues to maturity and production. Whatever kills the enemy is a remedy, whatever stays the disease is a cure. Neither adds a particle to the inherent life. Both simply remove obstructions and life goes on. The means and methods of killing the enemies and curing diseases are *remedial*, and a large part of the work of the Department is the study of these remedies. The Division of Entomology is charged with the killing of the animal enemies that attack plant and animal life; the Division of Vegetable Pathology, with remedies for the diseases of plants; the Bureau of Animal Industry, the diseases of animals. We will discuss the work of the last two first.

Manifestly the most logical way is first to find the cause of the disease, then the work of finding a remedy is simplified; the finding of the cause in very many cases suggests the remedy. It is true that experiment often finds a remedy, but with great waste of time and energy if the cause is unknown. What is the cause of plant disease? What is "pear blight?" What is "peach yellow," or "apple scab," or "black rot" in the vine? What is that "rice disease" which goes through a vineyard as a "flame of fire?" What is "rust" in wheat? What is "potato rot?" What is "mildew?" Again, what is the cause of diseases in animals? What is "hog cholera," or "swine plague," or "pleuro-pneumonia," or "Texas fever," or "tuberculosis," or "glanders," or "horse distemper?"

Now, modern science has gone far toward demonstrating that the ultimate cause of all these diseases and many not named is an infinitesimal "germ" or "spore." This germ or spore has a mysterious life of its own that attacks the life of the plant or animal. It attaches itself to the plant, and as a fungus sucks out its vitality. It enters the sap and destroys its nutritious qualities. It enters the blood, and curdles it as it were by its marvelous power of reproduction, till the "issues of life" are spent.

There is, however, a dispute, notably relating to plant diseases, as to whether these germs are the real cause of the disease, whether they are not in fact an effect. Worms, say one side, eat the dead body, not the live; mold takes hold of decaying not living wood. These spores attack only the dead or dying. The disease antedates the attack. Vultures will follow all day long the wounded deer to pounce upon him perhaps before his last expiring breath. So do these minute spores follow the decaying vitality of the seemingly vigorous plant, which is, in truth, moribund. In other words, that this fungus never troubles, or rather thrives on an absolutely healthy vine, but that the vine is in process of decay, though it may not seem so to the eye.

On the other hand, it is as emphatically claimed that it does attack healthy plants; that in the same orchard or vineyard, in the same row, where all grow in the same soil and are in the same condition of apparent health, growth, and vitality, one will be attacked and the other left; that the disease can be produced at will in healthy plants by inoculating the virus, that is the spore, into the sap; which facts would seem to settle the controversy in their favor. Whether it does or not, there can be no question that these spores either are the cause of death or hasten it, so that if they are killed before they have got in their work, the life is in one view saved, in the other prolonged. In either case the remedy is fruitful. The experiments of the Division of Vegetable Pathology fully establish this fact.

This diversity of opinion does not exist to the same extent, relative to the germ or spore existing in animal diseases. It is true, nevertheless, that it is claimed that many of the maladies are caused by the lack of vitality in the subject, by which it is unable to resist the attacks of the germs already in the system; that a healthy body has the ability to keep them in subjection, but any derangement, sometimes a simple cold and the hitherto inert forces take new life, and attack some vital part. It is manifest, however, that this theory will not account for diseases of a contagious type where an epidemic prevails, which travels over lines as well defined as a blizzard, striking down indiscriminately the strong and the weak,

the apparently healthy as well as the unhealthy. There is, however, an unsolved mystery in the ways of these unseen messengers of death; one is taken and another is left, even under like exposure and apparently like conditions. If it be proved as claimed, that the causes of these diseases is a living germ, substantial progress has been made. They have form and substance and life, and it is a relief from the terror inspired by the conception that the cause is something intangible as a spirit, impalpable as a ghost, but withering as a blast from the infernal regions. There is hope in the knowledge that these spores are living organisms, for it is almost axiomatic that every living thing can be killed. It may be by some poison, mineral or vegetable, by some substance that destroys the tissue in which it lives, by some parasite harmless to the animal but deadly to the germ, by the frosts of winter, by fire, fumigation and purification, whereby the nests in which it is bred, are wholly destroyed. It is believed that, as the next step, now that the cause is known, science will in time in each case find the remedy that shall kill the germ without killing the animal. It is a matter of some discouragement that up to date we have not been able to exterminate pleuropneumonia except in the destruction of the animal infected, but public attention has been sharply arrested on this point, and some of the ablest men of the world are investigating the problem. In the two divisions under consideration experts are studying in all their forms and phases these germs or spores that prey upon animal and vegetable life. In the laboratory, in the field, with microscopes, with germ culture, with fungicides, with vaccination of other or similar but less injurious germs, and in every way that science can suggest, or experiment can blaze the way, remedies are being sought, and in time, as before said, will be found in some form or other, as by Jenner for smallpox, Pasteur for hydrophobia, and Koch for tuberculosis.

The work of these two divisions, however, is not limited to this strictly scientific investigation. In the Division of Vegetable Pathology some of the experiments with fungicides have brought substantial results. A striking example bearing on this point is shown in the method of dealing with black rot of the grape. Before this disease was investigated by the Department nearly every grape grower had a theory as to the cause of it, but the question of a remedy was entirely beyond the imagination of the most sanguine. By scientific investigations, which covered months, it was shown that the disease was due to a microscopic fungus, and that the fungus passed through several stages. The character and life history of the fungus was determined, and this knowledge suggested the remedy which, when applied intelligently, can save the crop. Many farmers and fruit growers who have followed the instructions of the Department this year have saved from 80 to 90 per cent of their crop, while there was almost a total failure in the portions of the vineyards untreated. Reports of this season's work justify the statement that in this one line more has been saved by the comparatively few who followed instructions than the total expenditure of the division in all lines. The division has had under investigation a large line of plant diseases, chief among which are "peach yellows," "pear blight," "apple and pear scab," "pear and cherry leaf blight," the "California vine disease," "cotton anthracnose," "anthracnose of the hollyhock," a bacterial disease of the oat, which is destroying millions of bushels, "rots" of the sweet and Irish potatoes, "mildew" and "anthracnose

of the grape." In some the causes are still unknown or obscure. Others are perceptibly yielding to treatment, and there are high hopes of essential success in the near future.

The Bureau of Animal Industry was specially charged in 1886 with the eradication of pleuro-pneumonia among cattle, which at that time was so widespread and so terribly destructive. With a large force, mainly of veterinary experts, it attacked the disease, and has essentially stamped it out. To form some idea of the work done (and it was essentially scientific in its character) we need only to note the fact that from August 1, 1886, to November 30, 1888, there were inspected by the agents of the Bureau 50,838 herds, containing in all 300,737 cattle; there were found 1,428 infected herds, which contained 5,715 infected animals, and there were made 49,073 post-mortem examinations. Whenever a herd was found infected, or had an infected animal in it, it was at once quarantined, the infected animal slaughtered, and in fact large numbers of animals exposed to the contagion were likewise slaughtered and paid for by the Department. This work enlisted in its service the highest attainable skill in the country; for large interests were at stake, large sums of money expended, and a terrible evil was to be extirpated. That success has been attained is due in a large measure to the scientific work of the Department. In but one or two localities are there now any appearances or suspicions of the disease, and strict quarantine is still being made of all suspected animals. This is necessary for the reason that the germs of the disease may still exist in an undeveloped state, which on some propitious occasion will show itself and begin its devastating work. It is said that notwithstanding large expenditures of money in foreign countries, whence came the disease, nowhere has it been entirely eradicated; so, constant vigilance is required, not only to watch the least symptoms of revival of it here, but to prevent the importation of infected animals.

Entomology.—A large portion of our injurious insects are of foreign origin. We are the asylum of every downtrodden race of men, good, bad, and indifferent, and they bring with them from every clime the diseases and the insects incident to their countries. The result is that we are in number and variety the most pest-ridden country of the world. The Hessians are reputed as bringing with them the Hessian Fly, and it is not discrediting the Hessian soldier to say that the Hessian Fly has done far more harm to the country than did the soldier. George Washington could take him prisoner, but a generation could not capture the fly. The work, therefore, of the Division of Entomology is the most varied of any connected with the Department. When we take into account the fact that there are already listed nearly or quite three hundred thousand varieties of insects, only a small portion, it is true, injurious to agriculture, but a large portion likely at any time to become so by some change of temperature, some change or increase in the humidity of the climate, or some want of its natural source of sustenance, which may precipitate them in countless hordes upon growing fields, the importance of the science of entomology will be so obvious as to lift it into public consideration. A universally effective insect powder would command as ready sale as a well advertised patent medicine. Insects are the scourge of every farmer and fruit grower, and the life-long plague of every thrifty housewife. The work of this division has been so constant in studying their life history and characteristics, and the means of checking their ravages, that it could hardly have failed, if

it would, in accomplishing great good for agriculture. The information given as to remedies has been so ample, and the instructions as to methods of application have been so full, that it is needless to specify the particular instances of special benefit. The sum and substance of the instructions is to kill the insect and yet not kill the plant or animal or substance it infects. The experiments in insecticides and their application by spraying machines have been invaluable. These experiments have not been haphazard, but have been guided by scientific discrimination. One illustration will suffice. The persistent efforts of this division to discover a remedy for the ravages of the scale insect among the orange groves of California—ravages which in a short time from their beginning threatened to destroy the most promising branch of agriculture—have been crowned with success. It was due to the efforts of this division that a skilled entomologist was sent to Australia, where he discovered a parasite to the pest, though Australian scientists had denied its existence, and having discovered it brought home a supply for propagation in California. California fruit growers have asserted that the investigations and experiments have saved their oranges.

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REPORT OF THE CHIEF OF THE BUREAU OF ANIMAL INDUSTRY.

PLEURO-PNEUMONIA.

The year has passed without any discovery of contagious pleuro-pneumonia outside of the districts which were recognized in the last report as infected. The regulations of the Department have been enforced without difficulty, and the progress of the work for the eradication of this plague has been continuous and rapid.

No cases of the disease have occurred in the State of New York except on Long Island. No cases have been discovered in Pennsylvania during the year, although a constant inspection has been maintained. The last case discovered in Maryland occurred in October, 1889, and since that time the State has been free from all evidence of the contagion. The condition of New Jersey as regards this plague has also improved rapidly. No other States have been affected.

The efficiency of the regulations and of the methods employed under them is demonstrated by the fact that for two years there has not been a case of the disease outside of the very restricted areas on the Atlantic seaboard which have from the first been recognized as infected. These regulations are still in force, and with the almost complete eradication of the contagion the danger of any infection extending to other sections has practically disappeared.

REGULATIONS CONCERNING TEXAS FEVER.

The losses from Texas fever were so much reduced by the regulations of 1889 that a similar order was issued early in 1890 to take effect March 15. By commencing the supervision at this early date it was hoped that the infection of northern pastures might be entirely pre-

vented and the dissemination of the disease reduced to a minimum. This anticipated relief from the fever was very generally realized, but there were some outbreaks in Kansas which occurred from infection introduced before the regulations went into effect. This was no doubt due to the exceptionally warm winter and could not be foreseen.

The regulations, also, differed from those of 1889 by allowing no cattle from the Indian Territory or from Texas with the exception of the northern part of the Panhandle to mingle with the uninfected cattle. While it is doubtless true that the northwestern portion of the Indian Territory and a considerably larger section of Texas are free from permanent infection, the absence of local laws preventing free driving of dangerous cattle makes it unsafe to allow cattle from such districts to go into the same cars and yards as those from farther north. The full text of the order is as follows:

UNITED STATES DEPARTMENT OF AGRICULTURE,

OFFICE OF THE SECRETARY,

Washington, D. C., February 24, 1890.

To the Managers and Agents of Railroad and Transportation Companies of the United States:

In accordance with section 7 of an act of Congress approved May 29, 1884, entitled "An act for the establishment of a Bureau of Animal Industry, to prevent the exportation of diseased cattle and to provide means for the suppression and extirpation of pleuro-pneumonia and other contagious diseases among domestic animals," you are hereby notified that a contagious and infectious disease known as splenic or Texas fever exists among cattle in the following described area of the United States:

All that country lying south and east of a line commencing on the Mississippi River at latitude 36° 30' north, thence running westward on that parallel of latitude, being the southern boundary of Missouri, to the eastern boundary of Indian Territory, thence running northward to the southern boundary of Kansas, thence westward along said boundary of Kansas to the one hundredth meridian of longitude, thence southward along said one hundredth meridian of longitude to the southern boundary in Childress County in Texas, thence westward along the southern boundary of the counties of Childress, Hall, Briscoe, Swisher, Castro, and Parnier to the eastern boundary of New Mexico.

From the 15th day of March to the 1st day of December, 1890, no cattle are to be transported from said area to any portion of the United States north, east, or west of the above described line except in accordance with the following regulations: *Provided*, That these regulations shall not apply to any cattle taken into or through the State of Colorado for feeding purposes in accordance with the regulations of that State:

First. When any cattle in course of transportation from said area are unloaded north, east, or west of this line to be fed or watered, the places where said cattle are to be so fed or watered shall be set apart and no other cattle shall be admitted thereto.

Second. On unloading said cattle at their points of destination pens shall be set apart to receive them, and no other cattle shall be admitted to said pens, and the regulations relating to the movement of Texas cattle, prescribed by the cattle sanitary officers of the State where unloaded, shall be carefully observed. The cars that have carried said stock shall be cleansed and disinfected before they are again used to transport, store, or shelter animals.

Third. Whenever any cattle that have come from said area shall be re-shipped from any of the points at which they have been unloaded to other points of destination the car carrying said animals shall bear a placard stating that said car contains southern cattle, and each of the waybills of said shipment shall have a note upon its face with a similar statement. At whatever point these cattle are unloaded they shall be placed in separate pens, to which no other cattle shall be admitted.

Fourth. The cars used to transport such animals and the pens in which they are fed and watered and the pens set apart for their reception at points of destination shall be disinfected in the following manner:

(a) Remove all litter and manure. This litter and manure may be disinfected by mixing it with lime, diluted sulphuric acid, or, if not disinfected, it may be stored where no cattle can come in contact with it until after December 1,

(b) Wash the cars and the feeding and watering troughs with water until clean.
(c) Saturate the walls and floors of the cars and the fencing, troughs, and chutes of the pens with a solution made by dissolving 4 ounces of chloride of lime to each gallon of water, or disinfect the cars with a jet of steam under a pressure of not less than 50 pounds to the square inch.

The losses resulting yearly to the owners of northern cattle by the contraction of this disease from contact with southern cattle and through infected cars, and by means of the manure carried in unclean cars from place to place, have become a matter of grave and serious concern to the cattle industry of the United States. It is necessary, therefore, that this cattle industry should be protected as far as possible by the adoption of methods of disinfection in order to prevent the dissemination of this disease.

A rigid compliance with the above regulations will insure comparative safety to northern cattle and render it unnecessary to adopt a more stringent regulation, such as the absolute prohibition of the movement of southern cattle except for slaughter during the time of year that this disease is fatal.

Inspectors will be instructed to see that disinfection is properly done, and it is hoped that transportation companies will promptly put in operation the above methods.

Very respectfully,

J. M. RUSK,
Secretary.

It has been found that the regulation requiring a placard to be placed upon the car in which southern cattle are shipped is of little practical benefit, as shippers and others remove these marks in so many instances that this method of distinguishing infected cars cannot be relied upon. Railroad companies have, however, in nearly all cases, stamped their waybills in accordance with the regulations and this has proved sufficient for the identification of cars and cattle.

It will be noticed that the regulations thus far made have not extended east of the Mississippi River. There is no doubt, however, that the Gulf and south Atlantic States are infected with this disease to the same degree as Texas, and there should be the same regulation of cattle coming from them. The traffic has been so light and the difficulties of regulating it have been such that up to the present the attempt has not been made. Before the disease can be entirely prevented it will be necessary that the line of infection shall be drawn to the Atlantic seaboard and that the same rules be enforced east of the Mississippi as were enforced west of it during the last two years. This will prevent the infection of a number of stock yards that during the present year have been centers from which the dissemination of the disease has taken place with cattle bought both for home and for export markets.

On the whole the effect of these regulations has been extremely beneficial. As compared with former years but a small amount of the disease has been reported either in the United States or among cattle shipped abroad. The losses during the ocean voyage have been so much less than usual that insurance is said by shippers to have been reduced over 50 per cent. If this statement is correct it means a saving of over a million dollars to our shippers by this reduction of insurance alone.

Since the danger of shipping export cattle infected with pleuropneumonia has been removed a number of English writers have expressed great fear of the permanent introduction of Texas fever into Great Britain by cattle from the United States. This fear certainly must be groundless and one that could arise only through ignorance of the characters of the disease. In the first place, cattle that are sick from this disease do not transmit it to other animals, and consequently affected animals which are landed on the other side may

be left out of consideration as carriers of the infection. In the second place, cattle which are shipped by cars or boat lose the infection in about three weeks after leaving their native pastures. If, therefore, the time should come when Texas cattle shall be exported to Great Britain, there would be little danger from them, as it would require fully three weeks, if not longer, to transport them. In the third place, this disease never occurs in our Northern States until the middle of summer after there has been a protracted period of intense heat, the temperature of our spring and early summer being generally insufficient to develop the disease. The summer temperature in Great Britain is probably neither high enough nor is the high temperature continued a sufficient time to allow the development of this fever.

Leaving these facts out of consideration, we should be able to prevent the exportation of any cattle that are infected, or any that are capable of disseminating the infection, by properly enforced regulations which will prevent the mingling of southern and northern cattle in our cars and stock yards. The disease is one of the easiest to prevent of any which affects our domesticated animals, and for that reason we should be able to guard against all danger from it either to our own cattle or those of other countries to which our animals are sent.

The success of the regulations during the past two years has been all that was anticipated. It has not been found difficult to identify cattle from south of the line of infection in Texas by their brands, and railroad companies have, as a rule, been prompt to clean and disinfect their cars. The principal stock-yard companies have also furnished separate pens, which have been maintained with great regard to cleanliness and the proper handling of cattle, and from every point of view it has been demonstrated that the prevention of this disease is practicable without any hardship to those engaged in the cattle traffic. Indeed, it is now asserted that southern cattle bring better prices when sold from the quarantine yards than when indiscriminately mixed with other stock, and for this reason many lots of cattle from just north of the line are sent by choice of the owners to the quarantine yards for sale.

INSPECTION OF AMERICAN CATTLE IN GREAT BRITAIN.

The rapid progress and practically complete success of the work for the eradication of contagious pleuro-pneumonia from the United States removes the cause alleged by foreign governments for the exclusion of American cattle from their countries.

Great Britain for a number of years has maintained an absolute prohibition against the introduction of American cattle into that country, and only permits their reception at the foreign animal wharves, where they are to be slaughtered within ten days after their arrival.

The several governments of the continent of Europe have also enforced a quarantine of from two to four weeks on all American cattle, which has almost entirely prevented shipments from this country.

For a number of years the British authorities have reported the arrival at their ports of American cattle affected with contagious pleuro-pneumonia, and it became, therefore, absolutely necessary that this Bureau should be represented by its own officials at the

post-mortem examinations made, on American cattle at the foreign animal wharves in order that we should determine, to our own satisfaction, whether the lung disease found there was, as they claimed, contagious; and if it were found to be contagious, the affected animal should be traced back to the farm in this country from whence it came. With this object in view the aid of the State Department was solicited in opening negotiations through Minister Lincoln with the British Government looking to such an arrangement. Through the active coöperation of the State Department and the intelligent efforts of Minister Lincoln the privilege was obtained from the British Government of stationing three veterinary inspectors, one at each of the principal animal wharves where American cattle are slaughtered, and who would be allowed every facility in participating with the local officers in the work of inspecting and making *post-mortem* examination on American cattle landed in British ports. As soon as this privilege was secured three competent veterinary officers of the Bureau were dispatched to Great Britain in charge of the Chief of the Bureau of Animal Industry, who remained with them until their duties were clearly defined and the best means decided upon to enable them to carry on their work effectually and in harmony with the British authorities.

This work was commenced on August 16 of the present year, and from that date to November 8, inclusive, there were inspected and *post-mortem* examinations made on 104,296 head of cattle arriving in Great Britain from the United States at the several ports, as follows:

London.....	43,488
Liverpool.....	50,842
Glasgow.....	10,466

No indications of contagious pleuro-pneumonia were found in any of these animals, and on account of the eradication of the disease in this country it is believed that none will be found in the future.

INSPECTION OF EXPORT CATTLE BEFORE SHIPMENT.

The act of August 30, 1890, providing for the inspection of all export cattle, sheep, and swine, has enabled this Bureau to introduce a system of tagging export cattle by means of which it will be possible to determine the section of the country from which any animal has come that may be found at a foreign port affected with any disease. This act also prevents the exportation of any diseased animals. The amount of work required to carry out this inspection may be comprehended by the fact that during the year ending June 30, 1890, the number of animals exported was as follows:

Cattle.....	394,836
Hogs.....	91,148
Sheep.....	67,521

The following rules and regulations under the tenth section of the above named act were prescribed by the Secretary of Agriculture on October 20, 1890:

Order and Regulations for the Inspection of Cattle and Sheep for Export

UNITED STATES DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., October 20, 1890.

The following order and regulations are hereby made for the inspection of neat cattle and sheep for export from the United States to Great Britain and Ireland and the continent of Europe by virtue of the authority conferred upon me by section

19 of the act of Congress approved August 29, 1890, entitled "An act providing for the inspection of meats for exportation, prohibiting the importation of adulterated articles of food or drink, and authorizing the President to make proclamation in certain cases, and for other purposes."

(1) The Chief of the Bureau of Animal Industry is hereby directed to cause careful veterinary inspection to be made of all meat cattle and sheep to be exported from the United States to Great Britain and Ireland and the continent of Europe.

(2) This inspection will be made at any of the following named stock yards: Kansas City, Missouri; Chicago, Illinois; Buffalo, New York; Pittsburgh, Pennsylvania; and at the following ports of export, viz: Boston and Charlestown, Massachusetts; New York, New York; Philadelphia, Pennsylvania; Baltimore, Maryland; and Norfolk and Newport News, Virginia. All cattle shipped from any of the aforesaid yards must be tagged before being shipped to the ports of export. Cattle arriving at ports of export from other parts of the United States will be tagged at said ports.

(3) After inspection at the aforesaid stock yards all cattle found free of disease and shown not to have been exposed to the contagion of any contagious disease will be tagged under the direction of the veterinary inspector in charge of the yards. After tagging the cattle will be loaded into cleaned and disinfected cars and shipped through from said yards in said cars to the port of export.

(4) All animals will be reinspected at the port of export. All railroad companies will be required to furnish for the transportation of cattle and sheep for export clean and disinfected cars, and the various stock yards located at the ports of export shall keep separate clean and disinfected yards for the reception of export animals only.

(5) Shippers will notify the veterinary inspector in charge of yards of intended shipments of cattle, and will give to the said inspector when possible the name of the locality from which said animals have been brought and the name of the feeder of said animals, and such further and other information as may be practicable for proper identification of the place from which said animals have come.

(6) The inspector, after passing said cattle and tagging the same, will notify the veterinary inspector in charge of the port of export of the inspection of said animals, giving him the tag numbers and the number and designation of the cars in which said animals are shipped.

(7) Export animals, whenever possible, shall be unloaded at the port of export from the cars in which they have been transported directly at the wharves from which they are to be shipped. They shall not be unnecessarily passed over any highway or removed to cars or boats which are used for conveying other animals. Boats transporting said animals to the ocean steamer must be first cleaned and disinfected under the supervision of the veterinary inspector of the port, and the ocean steamer must before receiving said animals be thoroughly cleaned or disinfected in accordance with the directions of said inspector. When passage upon or across the public highway is unavoidable in the transportation of animals from the cars to the boat it must be under such careful supervision and restrictions as the veterinary inspector may in special cases direct.

(8) Any cattle or sheep that are offered for shipment to Great Britain or Ireland or the continent of Europe, which have not been inspected and transported in accordance with this order and regulations, will not be allowed to be placed upon any vessel for exportation, as they will be deemed under the law to have been exposed to infection so as to be dangerous to other animals.

(9) The supervision of the movement of cattle from cars and yards to the ocean steamer at the ports of export will be in charge of the veterinary inspector of the port. No ocean steamer will be allowed to receive more cattle or sheep than it can comfortably carry. Overcrowding will not be permitted.

(10) The veterinary inspector at the port of export will notify the collector of the port of the various shipments of cattle or sheep that are entitled to clearance papers, and certificates of the inspection of said animals will be given to the consignors for transmission with the bills of lading.

J. M. Rusk,
Secretary.

This work was inaugurated at the various ports of export named in the regulations on or about the 17th of November, and from that date up to the 28th of said month there have been inspected and

tagged 12,055 head of export cattle from the different ports, as follows:

Boston	8,708
New York	3,893
Philadelphia.....	518
Baltimore	2,559
Newport News.....	1,197
West Point, Va.....	185

The work of inspecting and tagging at the interior stock yards named in the regulations commenced on or about the 1st day of December, and the entire system as adopted is now in full running order.

INSPECTION AND QUARANTINE OF IMPORTED ANIMALS.

Regulations for the quarantine of neat cattle from the countries not located on the American continent continue to be enforced. The period of quarantine—three months—is regarded as amply sufficient under the regulations to prevent the introduction of disease, and no additional restrictions have been imposed, notwithstanding the fact of the restrictions imposed by Great Britain on cattle from this country and the additional fact that pleuro-pneumonia is much more prevalent and widely spread in Great Britain than it ever was in the United States.

There has long been danger of the introduction of foot-and-mouth disease by the importation of sheep, swine, and other susceptible animals that have heretofore been allowed to land without either quarantine or inspection; indeed this disease has several times been brought to this country by cattle from Great Britain, but it has fortunately been detected in time to prevent its dissemination here. Notwithstanding this fact our sheep have been excluded from Great Britain for more than ten years owing to the alleged existence of this disease in the United States, where it has never been seen except when brought by British cattle that were affected before landing.

In order to avoid any danger of the introduction of this disease from foreign countries into the United States the Secretary of Agriculture, under the provisions of the act of August 30, 1890, prescribed on October 13, 1890, the following regulations for quarantine and inspection of all neat cattle, sheep and other ruminants, and all swine imported into the United States:

Regulations for the Inspection and Quarantine of Neat Cattle, Sheep and other Ruminants, and Swine Imported into the United States. .

UNITED STATES DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., October 13, 1890.

In pursuance of sections 7, 8, and 10 of an act of Congress entitled "An act providing for the inspection of meats for exportation and prohibiting the importation of adulterated articles of food or drink, and authorizing the President to make proclamation in certain cases, and for other purposes," approved August 30, 1890, the following regulations are hereby prescribed for the inspection and quarantine of neat cattle, sheep and other ruminants, and swine imported into the United States:

(1) With the approval of the Secretary of the Treasury the following named ports are hereby designated as quarantine stations, and all cattle, sheep and other ruminants, and swine imported into the United States must be entered through said ports, viz, on the Atlantic seaboard, the ports of Boston, New York and Baltimore; on the Pacific seaboard, San Diego; along the boundary between the United States and Mexico, Brownsville, Paso Del Norte, Eagle Pass, Laredo, and Nogales;

and along the border or boundary line between the United States and British Columbia and Canada, through the custom ports in the collection districts of Annetonk and Bangor, Maine; Vermont, Vermont; Buffalo Creek, Niagara, Cape Vincent, Champlain, and Oswegatchie, New York; Detroit, Port Huron, and Superior, Michigan; Minnesota and Duluth, Minnesota; and Puget Sound, Washington.

(7) The word "animals," when used in these regulations, refers to and includes all or any of the following kinds: Neat cattle, sheep and other ruminants, and swine. The words "contagious diseases," when used in these regulations, includes and applies to all or any of the following diseases: Anthrax in cattle, sheep, goats, or swine; contagious pleuro-pneumonia in cattle; tuberculosis in cattle, foot-and-mouth disease in cattle, sheep, goats, and swine; rinderpest in cattle and sheep; sheep pox, foot rot, and scab in sheep; hog cholera and swine plague in swine.

(8) All cattle, sheep and other ruminants imported into the United States from any part of the world except North and South America shall be accompanied with a certificate from the local authority of the district in which said animals have been for one year next preceding the date of shipment, stating that no contagious pleuro-pneumonia, foot-and-mouth disease, or rinderpest has existed in said district for the past year. And all swine imported into the United States from any part of the world except North, Central, and South America shall be accompanied with a similar certificate relating to the existence of foot-and-mouth disease. All such animals shall also be accompanied with an affidavit by the owner, from whom the importer has purchased them stating that said animals have been in the district where purchased for one year next preceding the date of sale, and that neither of the above mentioned diseases have existed among them, or among any animals of the kind with which they have come in contact, for one year last past, and that no inoculation has been practiced among said animals for the past two years. Also by an affidavit from the importer or his agent supervising the shipment stating that the animals have been shipped in clean and disinfected cars and vessels direct from the farm where purchased; that they have not passed through any district infected with contagious diseases affecting said kind of animals, and that they have not been exposed in any possible manner to the contagion of any of said contagious diseases.

(9) The foregoing certificate and affidavits must accompany said animals and be presented to the collector of customs at the ports of entry and by him be delivered to the inspector of the Bureau of Animal Industry stationed at said port to allow them to be imported into the United States.

(10) All neat cattle imported into the United States from any part of the world except North, Central, and South America shall be subject to a quarantine of ninety days, counting from date of arrival at the quarantine station. All sheep and other ruminants and swine from any part of the world except North, Central, and South America shall be subject to a quarantine of fifteen days, counting from date of arrival at the quarantine station.

(11) Any person contemplating the importation of animals from any part of the world except North, Central, and South America must first obtain from the Secretary of Agriculture two permits, one stating the number and kind of animals to be imported, the port and probable date of shipment, which will entitle them to clearance papers on presentation to the American consul at said port of shipment; the other, stating the port at which said animals are to be landed and quarantined, and the approximate date of their arrival, and this will assure the reception of the number and kind specified therein at the port and quarantine station named at the date prescribed for their arrival, or at any time during three weeks immediately following, after which the permit will be void. These permits shall in no case be available at any port other than the one mentioned therein. Permits must be in the name of the owner of or agent for any one lot of animals. When more persons than one own a lot of animals for which permits have been issued a release from quarantine will be given each owner for the number and kind he may own, and this release will be a certificate of fulfillment of quarantine regulations. Permits will be issued to quarantine at such ports as the importer may elect, so far as facilities exist at such port, but in no case will permits for importation at any port be granted in excess of the accommodations of the Government quarantine station at such port. Every importer shall, on the day of the shipment from a foreign port, telegraph to the Chief of the Bureau of Animal Industry the number and kind of animals shipped, the vessel on which they are shipped, and the port at which they are to be landed. United States consuls at foreign ports are hereby notified to give clearance papers or certificates for importation of animals only upon presentation of permits as above provided, with dates of probable arrival and destination corresponding with said permits, and in no case for a number in excess of that mentioned therein.

(7) All animals imported into the United States shall be carefully inspected by a veterinary inspector of the Bureau of Animal Industry, and all animals found to be free from disease and not to have been exposed to any contagious disease, except as provided in regulation 5, shall be admitted into the United States. Whenever any animal is found to be affected with a contagious disease, or to have been exposed to such disease, said animal, and all animals that have been in contact or exposed to said animal, will be placed in quarantine, and the inspector quarantining the same shall report at once to the Chief of the Bureau of Animal Industry, who will direct whether or not said animals quarantined shall be appraised and slaughtered, as provided by section 8, of the act under which these regulations are made. All animals quarantined by reason of disease or exposure to disease shall not be admitted to the established quarantine grounds, but shall be quarantined elsewhere, at the expense of the importer, or be dealt with in such manner as the Chief of the Bureau of Animal Industry shall determine.

(8) In case of imported animals proving to be infected, or to have been exposed to infection, such portions of the cargo of the vessel on which they have arrived as have been exposed to these animals or their emanations shall be subjected, under the direction of the inspector of the Bureau of Animal Industry, to disinfection in such manner as may be considered by said inspector necessary before it can be landed.

(9) No litter, fodder, or other aliment, nor any ropes, straps, chains, girths, blankets, poles, buckets, or other things used for or about the animals, and no manure shall be landed excepting under such regulations as the veterinary inspector shall provide.

(10) On moving animals from the ocean steamer to the quarantine grounds they shall not be unnecessarily passed over any highway, but must be placed on cars at the wharves or removed to the cars on a boat which is not used for conveying other animals. If such boat has carried animals within three months it must be first cleaned and then disinfected under the supervision of the inspector, and after the conveyance of the imported animals the boat must be disinfected in the same manner before it may be again used for the conveyance of animals. When passage upon or across the public highway is unavoidable in the transportation of animals from the place of landing to the quarantine grounds it must be under such careful supervision and restrictions as the veterinary inspector may, in special cases, direct.

(11) The banks and chutes used for loading and unloading imported animals shall be reserved for such cattle, or shall be cleansed and disinfected as above before being used for such imported cattle.

(12) The railway cars used in the transportation of animals to the quarantine grounds shall either be cars reserved for this exclusive use, or box cars not otherwise employed in the transportation of animals or their fresh products, and after each journey with animals to the quarantine grounds they shall be disinfected by thorough cleansing and disinfection under the direction of the veterinary inspector.

(13) While animals are arriving at the quarantine stations, or leaving them, all quarantined stock in the yards adjoining the alleyways through which they must pass shall be rigidly confined to their sheds. Animals arriving by the same ship may be quarantined together in one yard and shed, but those coming on different ships shall in all cases be placed in separate yards.

(14) The gates of all yards of quarantine stations shall be kept locked, except when cattle are entering or leaving quarantine.

(15) The attendants on animals in particular yards are forbidden to enter other yards and buildings, except such are occupied by stock of the same shipment with those under their special care. No dogs, cats, or other animals except those necessarily present shall be allowed in the quarantine grounds.

(16) The allotment of yards shall be under the direction of the veterinary inspector of the port, who shall keep a register of the animals entered, with description, name of owner, name of vessel in which imported, date of arrival and release, and other important particulars.

(17) The veterinary inspector shall see that water is regularly furnished to the stock and the manure removed daily, and that the prescribed rules of the station are enforced.

(18) Food and attendance must be provided by the owners of the stock quarantined. Employes of such owners shall keep the sheds and yards clean to the satisfaction of the veterinary inspector.

(19) "Smoking" is strictly forbidden within any quarantine inclosure.

(20) No visitor shall be admitted to the quarantine station without special written permission from the veterinary inspector. Butchers, cattle dealers, and their employes are especially excluded.

(21) No public sale shall be allowed within the quarantine grounds.

(22) The inspector shall, in his daily rounds, as far as possible, take the temperature of each animal, commencing with the herds that have been longest in quarantine and ending with the most recent arrivals, and shall record such temperatures on lists kept for the purpose. In passing from one herd to another he shall invariably wash his thermometer and hands in a weak solution (1 to 100) of carbolic acid.

(23) In case of the appearance of any disease that is diagnosed to be of a contagious nature the veterinary inspector shall notify the Chief of the Bureau of Animal Industry, who shall visit the station personally or send a veterinary inspector, and on the confirmation of the diagnosis the herd shall be disposed of according to the gravity of the affection.

(24) The yard and shed in which such disease shall have appeared shall be subject to a thorough disinfection. Litter and fodder shall be burned. Sheds, utensils, and other appliances shall be disinfected as the veterinary inspector may direct. The yards, fences, and manure box shall be freely sprinkled with a strong solution of chloride of lime. The flooring of the shed shall be lifted and the whole shall be left open to the air and unoccupied for three months.

(25) In the case of the appearance of any contagious disease the infected herd shall be rigidly confined to its shed, where disinfectants shall be freely used, and the attendants shall be forbidden all intercourse with the attendants in other yards, and with persons outside the quarantine grounds.

J. M. RUCK,
Secretary.

[The designation of the ports, named in the foregoing regulations as quarantine stations, was approved by the Secretary of the Treasury on the 16th day of October, 1890, as provided by section 8 of the act of Congress approved August 30, 1890, providing for inspection of meats and animals.]

It is believed that these regulations will not only protect our herds and flocks, but in view of the assurances to that effect received from the British authorities it will probably result in the revocation by the British Government of its regulation excluding American sheep from Great Britain.

The inspection and quarantine of all cattle, sheep, and swine imported into the United States will add largely to the work of this Bureau. During the twelve months ending June 30, 1890, cattle were imported to the number of 30,695 head and sheep to the number of 393,794. The figures of the Treasury Department fail to give the number of swine imported.

The increased duties levied under the present law may greatly diminish the number of animals imported into this country, although during the year just past 3,935 head of cattle and 16,303 head of sheep were admitted duty free on the ground that they were imported for breeding purposes.

INSPECTION OF SALTED MEATS FOR EXPORT.

The act of August 30, 1890, provides "that the Secretary of Agriculture may cause to be made a careful inspection of salted pork and bacon intended for exportation, with a view to determining whether the same is wholesome, sound, and fit for human food, whenever the laws, regulations, or orders of the government of any foreign country to which such pork or bacon is to be exported shall require inspection thereof relating to the importation thereof into such country, and also whenever any buyer, seller, or exporter of such meats intended for exportation shall request the inspection thereof."

This inspection has been assigned to the Bureau of Animal Industry and all arrangements have been made to carry the law into effect. It is too early at this writing to estimate the quantity of

meat that the Department will be called upon to inspect under this law, but should the prohibition now enforced by certain continental governments be removed so far as regards inspected meats, as there is now reason to hope, there is no doubt but that the amount will be very large. The regulations adopted for this inspection are as follows: *

Regulations for the Inspection of Salted Pork and Bacon for Export.

UNITED STATES DEPARTMENT OF AGRICULTURE,

OFFICE OF THE SECRETARY,

Washington, D. C., September 12, 1890.

By virtue of the authority conferred upon the Department of Agriculture by section 1 of an act entitled "An act providing for the inspection of meats for exportation, prohibiting the importation of adulterated articles of food or drink, and authorizing the President to make proclamation in certain cases, and for other purposes," approved August 30, 1890, the following regulations for the inspection of salted pork or bacon for export, and the marks, stamps, or other devices for the identification of the same, are hereby prescribed:

(1) Whenever any foreign country, by its laws, regulations, or orders, requires the inspection of salted pork or bacon imported into such country from the United States, all packers or exporters desiring to export to said country shall make application to the Secretary of Agriculture for such inspection; also, whenever any buyer, seller, or exporter of such meats intended for exportation shall desire inspection thereof, he shall likewise make application to the Secretary of Agriculture for such inspection.

(2) The application must be in writing, and shall give the name of the packer of such meats, and, if the packer be the exporter, the probable amount of such meats to be exported per week or month for which inspection is requested; the name of the country, or countries, to which such meats are to be exported; the place at which inspection is desired and the date for such inspection. The applicant shall likewise agree to abide by these regulations, and to mark his packages as herein-after provided.

(3) Every package containing salted pork or bacon which has been inspected must be branded or stenciled both on the side and on the top by the packer or exporter, as follows:

FOR EXPORT.

(a) (Here give the name of the packer.)

(b) (Here the location and State of the factory where packed.)

(c) (Here give the net weight of the salted pork or bacon contained in the package.)

(d) (If exported by other than packer, the name of the exporter.)

(e) (Name of consignee and point of destination.)

The letters and figures in the above brand shall be of the following dimensions: The letters in the words "for export" shall not be less than three-fourths of an inch in length and all the other letters and figures not less than one-half an inch in length. All letters and figures affixed to the top and sides shall be legible and shall be in such proportion and of such color as the meat inspector of the Department of Agriculture may designate.

(4) The meat inspector of the Department of Agriculture, having, after inspection, satisfied himself that the articles inspected are wholesome, sound, and fit for human food, shall affix to the top of said package a meat inspection stamp, to be furnished by the Department of Agriculture, said stamps bearing serial numbers, and the inspector will write on said stamp the date of inspection. The stamp must be securely affixed by paste and tacks, in such a way as to be easily read when the package is standing on its bottom. Not less than five tacks shall be driven through each stamp, one at each corner and one in the middle.

The stamp having been affixed it must be immediately canceled. For this purpose the inspector will use a stencil plate of brass or copper, in which will be cut five parallel waved lines long enough to extend beyond each side of the stamp on the wood of the package. At the top of said stencil will be cut the name of the inspector, and at the bottom of said stencil will be cut the district in which inspection is made. The imprinting from this plate must be with blacking or other durable material, over and across the stamp, and in such manner as not to deface the reading matter on the stamp; that is, so as not to daub and make it illegible.

The stamp having been affixed and cancelled, it must immediately be covered with a coating of transparent varnish or other substance. Before the stamps used are made by the Inspector on the Chief of the Bureau of Animal Industry. The Inspector having inspected and found wholesome the contents of said package and affixed the stamp thereon, will issue to the packer or exporter a certificate of inspection, reciting the time and place of inspection, the name of the packer, the name of the exporter, and the name of the consignee and country to which exported. He will also place on said certificate the number of the package. One certificate only will be issued for each consignment and must designate the stamp numbers of all the packages contained in said consignment.

(5) The Inspector will enter in the stubs of his stamp book the information given by the packer's brand on the package inspected, and will report daily on blank form (m. i. 1) the number of stamps issued on each date and all the information required by said blank.

(6) The certificates of inspection will be furnished by the Department of Agriculture and be issued in serial numbers and in triplicate form. The Inspector will deliver one copy of said certificate to the consignee or shipper of such meat inspected, one copy he will attach to the invoice or shipping bill of such meat, and the third copy he will forward to the Chief of the Bureau of Animal Industry of the Department of Agriculture for filing therein. He will likewise make a daily report on blank form (m. i. 2) of all certificates issued on that date, and fill out said blank with all the information required thereon.

(7) Whenever the inspection of any salted pork or bacon is requested by an exporter or shipper at any other place than where packed, the packages containing such meats are to be opened and closed at the expense of the exporter, and said packages must be branded or stenciled in the same manner and contain the same information as prescribed in the case of inspection for a packer.

J. M. RUNK,
Secretary.

The new duties connected with this inspection of animals and meats, which have been assigned to this Bureau during the last year, will be seen by the above statement to be numerous and responsible. They involve a greatly increased amount of work, but their fulfillment will undoubtedly be of enormous benefit to the country, as they will insure the protection of our live stock from imported diseases and furnish a guaranty to foreign buyers that our meats are wholesome and that our export animals are free from the contamination of any communicable malady.

INVESTIGATION OF REPORTED DISEASES.

During the year the Bureau has been requested to investigate many cases of diseases supposed to be of a contagious nature, including a considerable number of cases of disease supposed by the owners of the animals to be contagious pleuro-pneumonia or foot-and-mouth disease. Careful investigation in every case showed that these suppositions were incorrect and that the affection was either an ordinary sporadic disease, or that it was tuberculosis or some other equally common disorder. There have been no cases of pleuro-pneumonia found except in a small district on Long Island and an equally small district in New Jersey, which has long been infected, but from which the contagion is now nearly or quite eradicated.

There have been several reports of foot-and-mouth disease in the interior of the country from persons who had never seen the European disease known by this name. Investigations have, however, shown in every case that the diagnosis was not justified by the facts, and that the actual disease was of a sporadic nature and not contagious. There has been no real foot-and-mouth disease in the United States since March, 1884, when it was introduced into the Portland quarantine station by cattle from Great Britain. The contagion in

this case was disseminated to a small extent outside the quarantine station, but it was immediately recognized and eradicated by prompt measures. With the three months' quarantine to which all bovine animals are subject, and the inspection of all other animals coming into the country, it is next to impossible to introduce foot-and-mouth disease without its being immediately recognized, and it would certainly be impossible for it to reach the interior of the United States without being discovered by the inspectors of the Department of Agriculture.

A recent circular issued by the State veterinarian of the State of Missouri, which was headed, "Foot-and-mouth disease," and which gave a somewhat detailed description of the symptoms of a disease which the State veterinarian thought might be the European foot-and-mouth disease, has excited considerable comment abroad and has been considered by some veterinary authorities as a demonstration of the existence of that disease; but careful investigation made by one of the inspectors of the Bureau demonstrated that the disease was not of a contagious nature, and that it had little, if any, resemblance to the foot-and-mouth disease of Europe. There had been no cattle or other animals taken to Missouri which had been imported from any country where foot-and-mouth disease exists, consequently there was no explanation of the appearance of a foreign contagion in that part of the country. Again, but one or two animals in a herd of twenty or thirty were affected, while with foot-and-mouth disease not one in a herd of that size would escape. In most cases there was little fever, the sores in the mouth were not of the nature of vesicles, and it is doubtful if any affected animals had any lesions about the feet which were the result of the disease. So small a proportion showed signs of lameness that this probably resulted in those animals from accidental causes.

There should be no difficulty in diagnosing at once such a disease as this as distinct from the foot-and-mouth disease of Europe. The foot-and-mouth disease could not originate spontaneously. It must have a point of origin by contagion which would connect the disease with the same malady in some other section of the world; again, foot-and-mouth disease is extremely contagious, being rapidly and unmistakably transmitted from animal to animal and from herd to herd. It attacks every animal in a herd, and not one animal in one hundred or even in a thousand exposed to the contagion escapes the disease, while the vesicles are prominent and unmistakable both in the mouth and about the feet. The increase in temperature and the fever are too marked to be overlooked. A disease with these characteristics has never existed in the interior of the United States. Rumors of such disease have been frequent, but they are started by people who are ignorant of the character of such diseases and who have had their imaginations excited by reading the accounts of these diseases in other countries.

Indeed, the reports are generally made in such a way as to show that the description of the disease is taken from some publication on the subject and not from the disease itself. This is the only possible explanation of the resemblance of the symptoms given in such reports to those observed in the disease suspected, for, when the disease itself is examined, such characters as they mention can not be found.

The report of the Bureau inspector, the main points of which were concurred in by the State veterinarian after a careful investigation, should be sufficient to remove any fears of the existence of this dis-

case in the United States. Indeed the report of the existence of the disease would have attracted little attention had it not been for the great interests at stake and the evident desire of parties in other countries to find a pretext to sustain the restrictions and prohibitions now in force against the introduction of American cattle. These parties have always been ready to give credence to the wildest rumors and to put the worst construction upon any report in regard to disease in this country. The order that all American sheep and swine should be slaughtered on the English docks on account of foot-and-mouth disease, which has been enforced for the last ten years, and the unhesitating acceptance of the recent rumors of the same disease are sufficient evidence of the correctness of this statement. The United States Department of Agriculture now has a large and capable force of veterinary inspectors, whose whole time is devoted to the investigation of diseases, and the official reports of this Department are worthy of the same respect and credence as the government reports of any of the countries of Europe. Usually when a government makes an investigation of a rumored disease its report is believed without question. The numerous attempts which have been made to discredit the conclusion of this Department after the investigation of the disease in Missouri, without giving any adequate reason for not accepting it, show that these parties are influenced in regard to American questions by motives which do not apply to the same subjects when affecting other countries.

SCIENTIFIC INVESTIGATIONS.

The original scientific research of the year has been mostly confined to southern or Texas cattle fever and to the infectious diseases of swine. With both very important results have been obtained from the scientific as well as the practical point of view.

SOUTHERN OR TEXAS FEVER OF CATTLE.

The discovery of a germ in the red corpuscles of the blood in this disease—a germ entirely distinct from bacteria but belonging to the protozoa—was mentioned in the report of last year. This notable discovery was abundantly confirmed by the investigations of the year just past, and an additional point in the problem has been brought to light.

It has long been suspected by cattle owners that the appearance of the disease in northern cattle was in some way connected with the ticks distributed by southern cattle. This hypothesis has, however, been generally discredited by scientific men, and indeed the evidence in favor of it was very slight and intangible. It seemed, however, worthy of investigation, and the result has been to obtain indisputable evidence that the disease is produced by ticks from southern cattle.

Ticks taken from southern animals and placed upon pastures which could have been infected in no other way, so infected these grounds that susceptible cattle placed upon them contracted the disease in the same length of time and were as seriously affected as were other susceptible cattle placed upon pastures in company with southern cattle. Again, young ticks that were hatched from the eggs of large ticks picked from southern cattle were placed upon susceptible animals and produced the disease.

There are, consequently, two factors in the production of southern fever—first, the tick, and secondly, the protozoal microorganism which lives in and destroys the red blood corpuscles of the affected cattle. Where the tick obtains the protozoön is not yet known, but that the microorganism can be transmitted from one generation of ticks to another through the egg is demonstrated. It is important to learn through how many generations of ticks the germ can be transmitted without losing its virulence and whether there is any other means by which it gains access to the system of cattle in addition to being introduced by the punctures made by ticks.

There are evidently ticks which do not harbor this minute parasite, because cattle susceptible to southern fever are frequently badly infested with ticks without showing any marked symptoms of disturbed health. On the other hand there may be means by which the protozoön gains access to the blood of cattle independently of the agency of ticks; but it appears from the investigations just made that in the great majority of cases cattle are infected by means of ticks. That is, the adult ticks drop from southern cattle and lay their eggs upon the pastures. The eggs hatch and the young ticks get upon susceptible cattle and produce the disease.

If this supposition is correct it is of great practical importance. In the first place, susceptible cattle taken to the South for breeding purposes could be protected from the fever by keeping them in such a manner that they would not become infested by ticks. That is, they could be kept in stables not previously occupied by other cattle, bedded with clean straw and fed upon hay or grass cut from fields where no cattle had been for a considerable time. In the second place, it would seem that southern cattle might be rendered innocuous by washing them with some preparation that would destroy the ticks, or by holding them upon uninfected ground a sufficient time for the ticks which are upon them to mature and drop to the ground, but not long enough upon any one pasture for the young ticks to hatch and reinfect them.

The probability of reaching important practical results is such that these investigations should be continued until the subject is thoroughly understood.

SWINE DISEASES.

The investigations of swine diseases have been carried on with the idea of determining (1) the relative prevalence of hog cholera and swine plague, (2) the value of protective inoculation by various processes as a preventive of hog cholera, and (3) to test the practicability of preventing those diseases by the use of the ptomaines or bacterial products developed by growing the germs in proper culture media.

These researches have shown that swine plague is relatively more prevalent than was first anticipated and that it is probably the cause of as much mortality as is hog cholera. They also confirm our conclusion of last year that inoculation is not a practical or reliable method of preventing hog cholera.

The investigations of the bacterial products have been very interesting, at least from a scientific point of view and as regards their application to the prevention of human diseases. This interest is increased at the present time by the announcement of the celebrated German investigator, Professor Koch, that he has discovered a remedy for tuberculosis. This remedy is now believed to be a product

of the growth of the bacillus of tuberculosis in appropriate culture material.

It should not be forgotten that the possibility of applying these bacterial products to the prevention and cure of diseases was first made evident by the investigations of the Bureau of Animal Industry, and that if Professor Koch's remedy is of the nature supposed his method consists in the application of a principle discovered here.

Our recent work in this line has been to separate the substance which has this preventive power from the many other chemical principles present in the culture liquids, and to study its nature and properties. This chemical work was placed in the hands of Dr. von Schweinitz with general directions as to the character of the investigations, in the spring of 1899, and since that time the products of the hog-cholera germ have been studied quite thoroughly and their remarkable power in conferring immunity has been confirmed.

Unfortunately these products are very irritating, and in the dose necessary to produce an effect upon the system of the hog they cause an inflammation at the point where injected into the tissues, which is a great objection to their use. They could be given in smaller and more numerous doses, but this increases the expense so much as to make their use impracticable. When administered by way of the stomach their effect is lost.

That this method of preventing disease with other maladies and other species of animals and particularly with mankind is destined to be of much service seems very probable. With this ultimate object in view we have endeavored to produce artificially a drug which would have the same composition and effect as the bacterial products. By such a process we hope to obtain the preventive agent at less expense and without danger of being contaminated with the deadly germs that cause the disease. To a great extent these researches have been successful and we are now able to produce a substance entirely by chemical processes which not only resembles the bacterial product of the hog-cholera germ in composition but which has almost if not quite the same power of conferring immunity from the disease.

By these preliminary studies we have worked out the proper methods of investigation, and it is hoped that by applying them to tuberculosis and other diseases which affect animals of greater value than hogs successful means of prevention may be secured. And if incidentally these methods of prevention can be applied to diseases affecting mankind, their value to the country and to the world will only be increased thereby.

* * * * *

CONDITIONS AFFECTING THE PRICE OF HOGS.

The conditions affecting the price of the animals produced upon the farm is one of the most interesting and important studies which can be made for the benefit of the stock grower, and as the chief of the Bureau has recently made an investigation of this subject a brief statement of the facts and conclusions are inserted in this report.

The fluctuations in the price of hogs appear at present to be more easily traced and more subject to principles that can be definitely formulated than the variations in the price of other farm animals, and consequently they have been selected for this preliminary investigation.

The calculations which follow are principally based upon the sta-

tistics of the United States Census Bureau, the estimates of the Statistical Division of the Department of Agriculture, the report of the Bureau of Statistics of the Treasury Department, and the annual report of the Cincinnati Price Current. The population for the intermediate years is estimated by the rate of growth for the ten years, taking account each year of the immigration.

The following table shows the population of the United States, the total hog product including lard put on the market by the packing establishments, the quantity which this constitutes per capita of population, the quantity of hog product exported, and the total and per capita quantity remaining for home consumption for each year since 1873:

TABLE 1.

Years.	Population.	Hog products.				
		Total.		Exported— year ending June 30.	Home consumption.	
		Pounds, year ending March 1.	Per capita.		Pounds.	Per capita.
1873	42,125,499	1,654,707,583	39.3	690,063,405	964,644,178	22.9
1874	43,281,338	1,701,314,614	39.3	623,415,255	1,077,899,359	24.9
1875	44,374,463	1,611,038,842	36.3	473,308,273	1,137,730,569	25.6
1876	45,431,588	1,457,743,118	32.1	550,331,120	907,411,998	20.0
1877	46,482,434	1,609,369,043	35.9	764,470,373	844,898,670	19.5
1878	47,550,552	2,045,230,979	43.0	1,007,371,526	1,037,859,453	21.8
1879	48,079,389	2,515,978,153	51.7	1,143,309,938	1,372,668,215	28.2
1880	50,155,783	2,423,530,072	48.3	1,280,792,175	1,192,737,897	23.8
1881	51,473,728	2,043,053,290	39.5	1,233,015,127	1,410,038,169	27.4
1882	52,928,275	2,357,332,478	44.5	798,841,840	1,559,090,638	29.5
1883	54,215,060	2,148,369,223	39.6	627,063,446	1,521,275,777	28.1
1884	55,435,564	2,228,427,478	40.2	715,142,817	1,513,284,661	27.3
1885	56,547,692	2,441,877,808	43.2	755,416,935	1,686,460,873	29.8
1886	57,613,057	2,580,117,826	44.9	800,784,530	1,780,333,296	31.0
1887	58,848,103	2,677,814,968	45.5	827,349,968	1,850,464,970	31.4
1888	60,155,898	2,523,552,000	42.0	792,079,845	1,731,472,157	28.8
1889	61,378,141	2,470,053,000	40.4	783,001,375	1,686,451,725	27.6
1890	62,022,250	3,047,651,000	48.7	1,159,643,885	1,888,007,115	30.1

The quantity of pork products put upon the markets by the packing houses of the East and West is partly estimated, but is so nearly correct that the exact figures could not in any way change the conclusions which are here drawn from the table.

We see by this table the enormous amount of hog product put upon the market in this country, an amount which varies in round numbers from 1,457 million pounds in 1876 to 3,047 million pounds in 1890. No account is taken of the hogs killed and consumed by farmers or sold in villages, towns, and cities, but which are not packed, as there are no definite data from which it can be determined. Although this quantity is large it probably has no great effect upon the price of hogs in the packing centers, since it is the visible supply of hog products, the quantity put into the channels of commerce by the packing establishments, which we would expect to influence prices.

As would be expected there has been a great increase of hog product during the years covered by the table. From 1873 to 1877 the total amount was less than 2,000 million pounds per annum, varying from 1,457 millions in 1876 to 1,701 millions in 1874. From 1878 to 1889 the product was over 2,000 millions each year, varying from 2,045 millions in 1878 to 2,677 millions in 1887, and reaching the enormous aggregate of 3,047 millions in 1890. The quantity which this constitutes per capita of population varies from 32.1 pounds in 1876 to 51.7 pounds in 1879 and is only 48.7 pounds for the great output of 1890.

The quantity of pork products exported reached the highest figures in 1880 and 1881, dropping off in 1882 and subsequently, as a result of the unfavorable restrictions and prohibitions imposed by several foreign governments. Deducting the exports from the total production we find that the quantity left on the domestic market for home consumption has varied from 19.5 pounds in 1877 to 31.4 pounds in 1887 and was 30.1 pounds in 1890.

In order to bring out the effect of demand and supply upon the price the following table has been compiled, which shows in parallel columns the cost of the hogs used for the winter packing in the West, the total hog product per capita, and the domestic supply per capita for the year:

TABLE 2.

Year.	Cost of hogs, winter packing to March 1.	Hog product, per capita.	Domestic supply per capita.	Year.	Cost of hogs, winter packing to March 1.	Hog product, per capita.	Domestic supply per capita.
1872	\$3.23	39.3	22.9	1882	\$9.06	44.5	28.5
1873	4.34	39.3	24.0	1883	9.39	39.6	26.1
1874	6.66	36.3	25.0	1884	5.18	40.9	27.1
1875	7.05	34.1	30.0	1885	4.20	43.2	29.7
1876	5.94	35.0	19.5	1886	3.06	44.2	31.0
1877	3.99	41.0	31.8	1887	4.19	45.5	31.4
1878	2.85	51.7	36.2	1888	5.04	42.0	29.0
1879	4.18	48.8	29.8	1889	4.00	40.4	27.4
1881	4.64	51.3	27.4	1890	3.06	48.7	30.1

This table shows that in a general way the cost of hogs has varied inversely with the total hog product per capita, that is to say, the cost has increased in most cases as the product decreased, and *vice versa*. The variations are not always, however, in this inverse sense, and there is even less correspondence to be found between the fluctuations in cost and the quantity remaining for domestic consumption per capita. It is evident that there is some influence aside from the mere question of supply and demand, which has had an equal or greater effect on the price of hogs. Our investigation indicates that this important factor is the price of corn.

The following table is compiled to show in parallel columns the value on the farms of the corn crop and the cost of hogs for the succeeding winter's packing:

TABLE 3.

Year.	Cost of corn on farms.	Year.	Cost of hogs, winter packing to March 1.
	Cents.		
1872	39.8	1872-73	\$3.13
1873	48.0	1873-74	4.34
1874	64.7	1874-75	6.66
1875	42.0	1875-76	7.05
1876	37.0	1876-77	5.94
1877	33.8	1877-78	3.99
1878	31.4	1878-79	2.85
1879	37.5	1879-80	4.18
1880	39.6	1880-81	4.64
1881	63.6	1881-82	6.06
1882	48.4	1882-83	9.06
1883	42.3	1883-84	9.39
1884	57.7	1884-85	5.18
1885	57.4	1885-86	4.20
1886	51.4	1886-87	3.06
1887	56.6	1887-88	4.19
1888	44.4	1888-89	5.04
1889	34.1	1889-90	4.00
1890	28.3	1890-91	3.06

The above table shows that the fluctuations in the price of corn and of hogs correspond so closely as to be really surprising. The only discrepancies are in accordance with what appears to be a general rule that there is a tendency, after corn has been high, for the price of hogs to be sustained or even to advance for one year after corn has declined.

These facts are best shown by the accompanying diagrams. The domestic supply of hog product per capita, that is, the total hog product put on the market by the packing houses less the quantity exported, is compared in Diagram A with the price paid by packers in the West for hogs used in the winter's packing. It will be seen that while the direction of the lines representing the fluctuations is generally in an opposite direction, this relation is by no means constant. It is evident that there are other and more important factors which influence the price of hogs.

Diagram B illustrates the fluctuations in the price of corn, the price of hogs, and the total hog product per capita placed upon the markets by the packers. By following the direction of the lines from year to year it is seen that there was a sharp advance in the price of the corn crops of 1873 and 1874, the price of hogs immediately following. The decline in the price of corn in 1875 was not at once followed by a decline in the price of hogs, but, on the contrary, the winter packing ending March 1, 1876, cost more than that of 1875, although made from cheaper corn. The reason for this is seen in the decline in production. In 1879, 1880, and 1881 we find another advance in corn, followed at once by an advance in hogs. Again we find the price of hogs advancing in the winter of 1882-'83, although the 1882 corn crop shows a very considerable decline in price. This advance in the price of hogs corresponds with a decreased production of hog product per capita of population. The second year of decline in the price of corn, that is, 1883, is followed by a marked decline in the price of hogs, and this corresponds with a slight increase in production of pork product. Then we find that, with the continued decline in corn during 1884 and 1885, there was also a decline in hogs. The 1886 corn crop brought more money and the price of hogs at once advanced. The crop of 1887 was still higher in price and the price of hogs again advanced. The 1888 corn crop was lower in price, and here we see the effect of the rule above referred to, for, while the price of hogs did not advance, it was sustained and the drop was very slight, only 5 cents per hundred pounds. In 1889 the price of corn was still lower and the drop in the price of hogs was very marked.

If, now, we turn our attention to the line on the chart showing the quantity of hog product in proportion to the population we find that in 1874 the price of hogs advanced before there was any decrease in production. The second year after the advance in corn the reduction in the quantity of hog product is marked, and the reduction continued one year after there was a fall in the price of corn. In 1878-'79 the production per capita reached the highest point, corresponding with the low-priced corn crop of 1878. In 1880 there was a decrease in hog product corresponding to the advance in corn, and in 1881 we find an exception to the rule—an increase in hog product and at the same time a second increase in price of corn. Then comes a drop in production in 1882 corresponding to the increase in the price of the corn crop of 1881. With the drop in the price of corn in 1882 we find that the hog product instead of increasing continued to decrease. This shows a tendency, exhibited also in 1876, that should be noted, which

is that the hog product does not always respond to a fluctuation in the price of corn until the succeeding year. That is, when the hog crop has been decreasing for one or more years it requires some time to change the conditions and increase it, or *vice versa*. We see the operation of this rule again in the increase in the product of 1887 over 1886, although there was an advance in the price of the crop fed. So again the decrease in the price of corn in 1888 over 1887 was not followed by an increase in hog production until the succeeding year.

From these facts we may conclude that during the eighteen years covered by the tables and charts the following general rules appear to bear upon this question:

(1) The price of hogs increased with the price of corn without regard to the amount of hog product placed upon the market.

(2) After an advance in the prices of corn and hogs for a series of years the price of corn dropped one year before the decline came in the price of hogs.

(3) The fluctuation in the quantity of hog product per capita of population which followed an advance or decline in the price of corn after having moved in the opposite direction did not usually occur until a year had intervened. When corn had been high this failure of the hog product to increase with the first decline in corn kept up the price of hogs or even increased it for one year after corn dropped; but when corn had been low the failure of the hog product to decrease in quantity the first year that corn advanced did not prevent the advance in the price of hogs immediately following the increase in the price of corn.

It would appear that the above conclusions are worth remembering, for if these rules have held good for eighteen years they will likely apply for some time in the future.

Having determined some of the factors which have influenced the price of hogs, and having found that the most important of all was the price of corn, it may be well to briefly consider the causes which fix the latter. The following table shows the price of corn, the total production, and the production per capita of population.

TABLE 4.

Year.	Price of corn.	Production per capita.	Total production.	Year.	Price of corn.	Production per capita.	Total production.
	Cents.	Bushels.	Bushels.		Cents.	Bushels.	Bushels.
1873	48.0	22.1	932,274,000	1882	45.4	20.5	1,617,095,100
1874	67.7	19.6	850,148,500	1883	42.0	22.6	1,551,920,500
1875	42.0	23.8	1,321,069,000	1884	35.7	32.4	1,790,529,000
1876	37.0	28.2	1,289,827,500	1885	32.8	34.2	1,936,170,000
1877	35.8	28.8	1,342,558,000	1886	30.6	29.2	1,625,441,000
1878	31.8	22.2	1,398,218,750	1887	44.4	34.7	1,456,161,000
1879	37.5	30.0	*1,754,591,076	1888	54.1	33.0	1,687,793,600
1880	39.6	34.2	1,717,434,543	1889	38.8	34.4	2,112,822,000
1881	63.6	23.2	1,194,916,000				

* Census.

Beginning with 1872, there was a decreased production of corn per capita of population in 1873, and a further decrease in 1874, and that there was a corresponding increase in price. In 1875 there was an increase in production and a decrease in price. In 1876 there was a decrease in production and a further decrease in price. In 1877

there was a slight increase in production and an equally slight decrease in price. In 1878 there was another increase in production and a decrease in price. In 1879 there was a considerable increase in production and also an increase in price. In 1880 there was a slight decrease in production and a slight increase in price. In 1881 there was a great decrease in production and an equally marked increase in price. In 1882 the production increased and the price decreased. In 1883 there was a decrease both in production and price. In 1884 and 1885 the production increased and the price decreased. In 1886 and 1887 the production decreased and the price increased. In 1888 and 1889 the production increased and the price decreased. This shows that as a rule the increase in production corresponds with the decrease in price, and *vice versa*, the only exceptions being found in the years 1876, 1879, and 1883, or three years in the eighteen covered by the diagram.

It is interesting to note concerning the three exceptional years just mentioned that two of them, 1876 and 1883, correspond to the years on Diagram B, where it is shown that the price of hogs advanced in spite of the fact that the price of corn declined. That is to say, the reduction of the stock of hogs not only increased the price of hogs but lowered the price of corn, because there were not so many hogs to feed and the corn which would otherwise have been fed was put upon the market. The remaining exception, 1879, which is a fluctuation in the opposite direction, corresponds to the year on Diagram B when the production, and, consequently, the stock of hogs had reached the highest point. The large stock of hogs then on hand evidently was the means of furnishing a home market for the corn and caused an advance in price when under other conditions there would have been a further decline.

The price of corn is therefore governed primarily by the law of supply and demand, but it may also be influenced by the financial condition of the country, the purchasing power of money, and the relative supply of other cereals, and perhaps by other conditions.

There is one other point deserving of consideration in this connection. It is a very common custom when corn advances in price for farmers to hurry their hogs to market and reduce their breeding stock. A glance at the table demonstrates the existence of this custom, for we see that the hog product was invariably decreased as the price of corn advanced and when the price of corn declined the hog product again increased.

This fact has led the writer to inquire if there was in reality any less return to the feeder for each bushel of corn when the price was high than when it was low. To determine this the three years 1874, 1881, and 1887, were taken, at which the ascending lines were at their highest point, and it was found that the average price of corn for those years was 57.5 cents and the average price of hogs \$5.92—that is, the value of a bushel of corn was equivalent to the value of 9.54 pounds of hogs.

Taking now the four years 1872, 1878, 1885, and 1889, when the descending lines reached their lowest point, we find the average price of corn to have been 33.2 cents and the average price of hogs \$3.47. In this case a bushel of corn is equal in value to 9.56 pounds of hogs, or practically the ratio is exactly the same as when corn was high.

It appears that the best returns for hogs in comparison with the price of corn were received during the intermediate years between

the extremely high or extremely low prices. Taking the eight years 1873, 1876, 1877, 1879, 1880, 1883, 1884, and 1886, we find the average price of corn to have been 39 cents and the average price of hogs \$4.59. For these years it will be seen that 8.5 pounds of hogs brought as much as a bushel of corn.

These facts are important as indicating the proper course for the farmer to pursue under the varying conditions which are here considered. Their application is so plain to those that are interested that it is not necessary to go into greater details in this report.

INVESTIGATIONS OF THE INFECTIOUS DISEASES OF ANIMALS.

By Dr. THEOBALD SMITH.

The following brief account of the investigations conducted under my direction into the nature of the infectious diseases of animals has been prepared by Dr. Theobald Smith, who is in charge of this branch of the work of the Bureau of Animal Industry. All minor details, as well as the greater part of the autopsy notes, have been reserved for special reports, and only the most important results are given in this place.

INVESTIGATIONS OF TEXAS CATTLE FEVER.

The investigations into the nature and causes of Texas or southern cattle fever have been busily pushed during the summer of 1890, and some very important advances made which are destined to be of great practical importance.

During the summer of 1888 much time was spent in determining whether or not any specific bacteria are the cause of this disease as they are of a host of human and animal infectious diseases. This was the more necessary inasmuch as former observers have always described bacteria of one kind or another associated with it. But no bacteria could be found in the bodies of animals which had succumbed to Texas fever excepting those which quite invariably multiply in dead bodies after a time and have no significance whatever. At the same time the writer came to the conclusion that the disease was confined to the blood and consisted essentially in a breaking down of the red corpuscles.

During the summer of 1889 arrangements were made by which the disease could be studied near the laboratory in Washington, and, as reported last year, a parasite was found within the red corpuscles whose presence could only mean the breaking up of the corpuscle itself sooner or later. This discovery was adapted to explain satisfactorily the various lesions observed, as well as the great reduction in the number of corpuscles observed in those cases which died after prolonged disease or which ultimately survived. In some of these cases the blood is watery; it has in fact scarcely any color remaining. This condition was expressed mathematically by counting the number of blood corpuscles. Thus in most cases before death the number of corpuscles was but one-sixth of the number normally present in the body. When we contemplate the very important functions of these elements we need not be surprised at the serious effects resulting from loss to the body, within one or two weeks, of five-sixths of its corpuscles.

During the present year the disease was produced at the Experiment Station by the importation of North Carolina and Texas cattle and the investigations continued. The work was sufficiently extensive to occupy most of the time from July to December, while the examination of preparations and other work connected with this subject occupied much of the writer's time last winter and will of necessity require much additional labor this winter.

During the summer about fifty-three native animals, distributed around in various experimental inclosures at the station, received more or less careful attention. The temperature of all was taken every other day by Dr. Kilborne to detect the beginning of the disease. Of these about twenty-four either succumbed to Texas fever or else were killed in a dying condition. These cases were subjected to a careful *post-mortem* examination, and the internal organs underwent a careful microscopic scrutiny at the laboratory. The surviving animals were examined at different intervals of time more especially with reference to the condition of the blood. The blood corpuscles were counted and carefully examined with reference to the presence of the Texas fever parasites in order to determine the presence of any disease and the progress it was making. Those animals that died were also examined more or less frequently during the course of the disease in the same way. It was found moreover that these blood examinations were absolutely necessary in many cases to detect any disease whatever, and they put the field experiments, to be outlined later on, on a positive basis.

The examination of the internal organs, such as the spleen, liver, and kidneys, from those animals that died of Texas fever showed the presence of the blood parasite described last year in every case; in some in such enormous numbers that every other blood corpuscle appeared infected. In the course of the disease the parasites were detected in many of the cases examined. They were also present in the circulating blood one or two days before the animal died.

This parasite, which, as has been stated before, does not belong to the bacteria but to the protozoa, received considerable attention during the summer. It has appeared under several forms, and distinct amœboid movements of the largest forms were seen within the red corpuscles whenever the preparation was maintained above a certain temperature.

The work of the summer has thus confirmed that done during the two previous summers. There can be no doubt of the existence of genuine parasites within the red corpuscles and their destructive activity.

THE RELATION OF TICKS TO TEXAS CATTLE FEVER.

While the investigations into the nature of this disease were going on other equally important work was being carried on at the Experiment Station on the external characters of the disease.

It is well known to those who have come in contact with southern cattle in summer that they are infested with the so-called cattle-tick, a pest belonging to the class *Arachnoidea* and to the family *Ixodidae*. These ticks are carried north with cattle during the warm season of the year. When fully matured they drop off from the southern animals, lay their eggs on the ground, and perish. The young ticks are hatched within fifteen to thirty days after the eggs are laid and at once get upon the cattle where they become mature within twenty

to thirty days to again drop off, lay their eggs, and die. This process goes on continuously until the cold weather comes.

At various times and in different parts of the country it has been suggested that the ticks were the cause of Texas fever in northern cattle. This inference was undoubtedly suggested by the fact that nearly all cattle that die of Texas fever are observed to have these ticks of various sizes attached to the skin. Moreover the disease only makes its appearance after the young ticks have attached themselves to cattle. Though this was purely a *post hoc propter hoc* inference, it was nevertheless true, as the experiments to be recorded will amply prove.

During the summer of 1889 Dr. F. L. Kilborne, in arranging the various inclosures at the Experiment Station for the exposure of native cattle to the infection of Texas fever, conceived the happy idea of testing this popular theory of the relation of ticks to the disease. This he did by placing southern (North Carolina) cattle with native cattle in the same inclosure and picking the ticks from the southern stock as soon as they had grown large enough to be detected on the skin. This prevented any ticks from maturing and infecting the pasture with the eggs and hence prevented any ticks from infesting native cattle subsequently. At the same time, in another inclosure, the ticks were left on the southern cattle. The natives in the latter field died of Texas fever; those in the former did not show any signs of the disease.

Another experiment was made in September in the same manner by preparing three fields, one with southern cattle and ticks, a second with southern cattle from which the ticks were removed, and a third over which only adult ticks had been scattered. The result was equally positive. In the first field no natives died, but careful examination of the blood by the writer showed Texas fever in an unmistakable manner. In the "tick" field one animal died of Texas fever, and the examination of the blood showed that most other natives in the field were sick. In the third field containing southern cattle without ticks no disease could be detected.

These two tests pointed directly to ticks as being in some way the cause of Texas fever. At the same time it was thought best to confirm these results by further experiments during the present year before other agencies could be eliminated. The immediate inference was that the ticks infect the pastures, and that in some unexplained manner the infection finds its way into the body of susceptible cattle. The preliminary conclusions deducible from the work of 1888 and 1889 can be formulated as follows:

(1) Texas fever is a disease not caused by bacteria. Its nature can not be understood by supposing a simple transfer of bacteria from southern cattle to pastures and from pastures to northern cattle.

(2) The cause is very probably a protozoön, with a more complex life history, living for a time within the red corpuscles of infected animals.

(3) Southern cattle without ticks can not infect a pasture.

(4) Ticks alone scattered on a pasture will produce the disease.

The work of 1890 was planned to confirm or refute these preliminary conclusions and to furnish additional information.

The fields were arranged as before. One contained North Carolina cattle with ticks, a second Texas cattle with ticks, a third North Carolina cattle without ticks, a fourth ticks only, and a fifth soil

from the pastures of infected North Carolina farms. Other fields were also laid out to test questions which need not engage our attention in this brief survey.

The results confirmed those of last year. The first animal to die was in the "tick" field, containing no southern cattle. No disease appeared in the soil field. Unfortunately, owing to the limited space of ground at our disposal and its barren, rolling character, ticks or eggs were washed during the very heavy rains of the summer from the tick field into the field containing southern cattle without ticks, although a wide lane intervened. The natives in this field thereupon all died of Texas fever. At the autopsy of these cases ticks were found attached to their skin in abundance.

The disease caused by Texas cattle could not be distinguished in character from that which was produced by North Carolina cattle. These results similarly pointed to ticks as the cause. The precise manner in which they caused the disease was by no means clear, however. The theory which seemed for a time most acceptable was that the adult ticks as they dropped off infected the pastures with germs which they had taken in with the blood of southern cattle, and that the germs were introduced into the body of northern cattle with the food. At the same time no parasite could be detected in the blood of southern cattle examined at various times, on which fact I would lay no great stress, however. Of more importance is the peculiarity which is exhibited by this disease in its period of incubation, as it may be provisionally denominated, and which is opposed to this theory. Thus, when native and southern cattle are placed on the same pasture at the same time it will take from forty to sixty days for the disease to appear. After the disease has once shown itself fresh animals placed on the same pasture may die, according to our experience, within thirteen days after the beginning of the exposure. We might say that the virus has "to ripen" on the pasture, which takes nearly two months, depending on meteorological conditions. When once "ripened" this virus does its deadly work within two or three weeks. This explanation, however, would be merely formulating our ignorance concerning the true nature of the infectious principle.

To the writer there seemed but one inference to be drawn from the facts and that is that the presence of young ticks is in some way directly associated with the appearance of the disease. It requires from forty to sixty days for the matured ticks to drop from the southern cattle and the eggs laid by them to develop into young ticks. After that period young ticks are present on the pastures until they are destroyed by the cold, or until the cold interferes with the development of the embryo in the egg. In other words, the period of incubation of the disease is explained without any difficulty by the life history of the tick.

The question was solved, experimentally, in the following manner: Eggs laid by ticks sent from North Carolina were placed on dried leaves in a dish partly filled with moist soil and kept in the laboratory until the young emerged from the egg. The period of incubation depends entirely upon the relative amount of heat, and has varied from fifteen days in midsummer to forty days in November, when the rooms of the laboratory became cold at night (50° to 60° F.). These ticks were placed on four different animals of different ages, kept away from any infected inclosures. Two were placed in stalls,

one of them on an adjoining farm, and two were allowed to stay in a patch of woodland with healthy cattle. Of these four two died of Texas fever, as determined by careful *post-mortem* examination. One of them was in the stall away from the Station, the other in the patch of woodland. The other two became very ill; one of them never recovered but had to be killed later on, the other recovered. In all of them the germs were observed in the blood. The disease possessed the same characters as those observed in cattle in the infected pastures during the summer. There was an elevation of temperature from nine to twelve days after the young ticks were placed on the animals, going as high as 107° F. in one animal. Accompanying the fever a gradual reduction in the number of blood corpuscles was observed. In order to show more conclusively the truth of the statements made a few brief notes from one of the experimental cases is appended:

No. 144.—Cow about eight years old, purchased September 16 from a neighboring farm and placed among a number of healthy reserve cattle in a piece of woodland at some distance from any infected field.

September 17.—A considerable number of young ticks, hatched in the laboratory from the eggs laid by ticks sent from North Carolina, placed on this animal.

September 18.—Temperature 101.2° F., 6.3 millions red corpuscles in blood; normal.

September 24.—Another lot of recently hatched ticks placed on the animal.

September 27.—A. M., temperature 104° F.

September 29.—10.45 a. m., temperature 106.2°, pulse 54, respirations 37, 4.93 millions corpuscles in blood. Ticks abundant on body, especially on inside of thighs. Still quite small.

September 30.—P. M., 107°.

October 1.—P. M., 106.8°.

October 2.—P. M., 104°.

October 3.—Found dead this morning. Seen alive at 6 p. m. yesterday. A large number of ticks on animal, just through second molt. None of them large as yet. Lungs only partly collapsed; trachea and bronchi filled with foam. Ecchymoses under epicardium of both ventricles of heart and under endocardium of left ventricle.

Spleen very large, blackish, soft. Weighs 4 1-16 pounds. (Normal weight about 2 pounds.)

Liver weighs about 12 pounds; enlarged, yellowish on section. Complete injection of the intra-lobular bile capillaries. Extensive fatty degeneration of liver tissue. Occasional groups of hæmatoidin crystals.

Bile dark, scarcely flows. Density due to large quantity of yellowish flakes and mucus.

Kidneys deeply congested; tubules contain much yellowish pigment. Urine in bladder of a deep, port wine color, barely translucent in small test-tube; alkaline; specific gravity, 1015; no sediment; albuminous precipitate very abundant (.6 per cent. according to Esbach). Heavy flocculent precipitate when acetic acid added (hæmoglobin).

In preparations of blood from the heart, of liver, spleen, and kidneys a small number of corpuscles contain parasites, in contracted state, from 1.5 to 2 micromillimeters in diameter. In the blood, spleen, liver, and kidney preparations a moderate number of large bacilli of *post-mortem* growth. (These bacilli are invariably present when the animal dies early in the night and is not examined until next day. They are never found in animals killed in a dying condition. They occur in other diseases under similar conditions.)

These brief notes demonstrate that Texas fever can be produced by placing young ticks on cattle, and that the disease can not be due to any abstraction of blood, for the ticks were still quite small and had scarcely begun to draw blood on a large scale. Moreover the corpuscles perished *in the body* as is shown by the coloring matter in the urine, by the thick bile, and the presence of pigment in the liver and kidneys. No disease appeared among the other cattle in the same inclosure.

While the nature of Texas fever is by no means made clear as yet, we are able to affirm that ticks can produce it. Whether the disease can be transmitted by any other agency must be decided by future investigations. Meanwhile the evidence accumulated thus far seems to favor very strongly the dictum: No ticks, no Texas fever.

SWINE DISEASES.

AN EXPERIMENT TO TEST THE VALUE OF SUBCUTANEOUS INJECTIONS OF HOG CHOLERA BACILLI AS A MEANS OF PREVENTING HOG CHOLERA.

In the report for 1889, page 87, it was stated that an experiment was in progress which we hoped would be a final test as to the practical value of subcutaneous injections of cultures of hog cholera bacilli in making swine insusceptible to the virus of hog cholera. The first tests in this direction were made at the Experiment Station early in 1886, soon after the hog cholera bacillus had been discovered. The tests at that time consisted in making two injections under the skin of minute quantities of culture liquid containing hog cholera bacilli, several weeks apart. This method was modeled after that of Pasteur in anthrax vaccination. No favorable result could be detected at that time. Although there was little hope that such a method would prove efficacious in another trial, still it was thought best to make it inasmuch as the disease to which the inoculated swine had been exposed in 1886 was of more than the usual virulence.

The method of subcutaneous injections of culture liquids containing hog cholera bacilli while on the one hand fraught with the possible danger of scattering disease germs where they do not originally exist is nevertheless the simplest and cheapest method that can be devised for the vaccination of animals; these qualities of simplicity and cheapness are of vital importance in a question which has only a commercial aspect. It was therefore thought best to give this method another and final trial, and in planning such an experiment it was considered necessary to eliminate all those sources of error which might possibly lead to an erroneous interpretation of results. Hence the following important conditions were kept in view:

(1) The animals must be young, unexposed hitherto even to a suspicion of disease. (2) There must be a large number of control or check animals of the same age and breed, which are to be subsequently exposed to the disease under precisely the same conditions as the vaccinated animals. (3) The disease to which they are exposed must have been carefully studied, the absence of other infectious diseases, such as swine plague, determined, and the virulence of the hog cholera germs causing it tested on rabbits. The disease must be virulent enough to prove fatal to the control animals to make the test of any value whatever.

That all these conditions are of prime importance is evident from general considerations, and was made evident in a very striking manner by the outcome of the experiment as will be seen further on.

The vaccine used.—In order to obviate the fatal effect of doses of hog cholera cultures injected under the skin which sometimes shows itself quite unexpectedly, especially in young animals, the writer deemed it advisable to reduce the virulence of the cultures by appro-

priate means, so that larger quantities of the culture liquid might be injected to increase, if possible, the vaccinating effect without endangering the life or stunting the future development of the animal.

In reducing the virulence, or attenuating it, as it is more commonly denominated, the following method was pursued: Tubes of peptone bouillon* inoculated with hog cholera bacilli were placed in a favorable temperature for multiplication (95 to 100°) over night. On the following day the culture liquid, now slightly clouded, was placed in an unfavorable temperature of 110 to 111° F. (43.5 to 44° C.) and kept there for about ten days. Thereupon fresh tubes were inoculated from these and subjected to the same process. From time to time rabbits were inoculated to test any attenuation that might have taken place, and it was noticed that there was a slight modification of the disease in rabbits after a time. After the bacteria had thus been exposed to a high, unfavorable temperature for more than two hundred days and passed through twenty cultures, a small dose of one-tenth cubic centimeter (one five-thousandth of a pint approximately) injected under the skin did not prove fatal to a rabbit, while larger doses were still fatal. Small quantities injected into an ear vein were likewise fatal. The reduction of virulence was therefore not very great, even after this very prolonged exposure to a high temperature. At the same time it was thought advisable to use it as vaccine *a*.

A second vaccine was prepared at the same time. It was exposed for only ninety to one hundred days, and passed through nine cultures in place of twenty, as with vaccine *a*. It was still virulent enough to kill rabbits in small doses, and in fact there was little difference between this and the original virus. This we shall call vaccine *b*.

The animals used.—The pigs that were chosen for vaccination numbered forty-eight in all. Of these twenty-seven were from one farm in the District of Columbia where no disease had existed among swine for years. They were all raised in pens. The remaining twenty-one were obtained from a farm in the District which likewise had been free from disease for a long time. They, however, had not been raised in pens, but were allowed to range over a large pasture. At the time of vaccination they were all about three months old. The first lot were the product of an Essex boar and Berkshire sows, pure bred. The second lot were mixed Jersey Reds and Chester Whites, grades. At the date of vaccination they weighed from 50 to 75 pounds each, the weight being slightly in favor of the first lot.†

A large pen had been built for this purpose, divided into compartments, which were separated from one another by tight board partitions. We will denominate for convenience the twenty-seven penned swine as lot A, the twenty-one pasture-fed pigs as lot B. They were divided as follows:

In compartment 1.....	7 of lot B.
In compartment 2.....	7 of lot B.
In compartment 3.....	7 of lot B.
In compartment 4.....	empty.
In compartment 5.....	9 of lot A.
In compartment 6.....	9 of lot A.
In compartment 7.....	empty.
In compartment 8.....	9 of lot A.

* Beef broth containing a little peptone and common salt.

† The selection of pigs, arrangement of pens, and inoculations were made by Dr. F. L. Kilborne.

The vaccination consisted in injecting a definite quantity of peptone bouillon, in which the attenuated bacilli had grown for about twenty-four hours, into one or both thighs according to the quantity used. The date of the two vaccinations and the quantity injected into each pig is given in the following table:

Compart- ment.	Lot.	October 18, 1899.	November 5, 1899.	
1.....	B.	Checks.....	4 receive $\frac{3}{4}$ cubic centimeters.....	Vaccine b
2.....	B.	10 cubic centimeters* vaccine a.....	3 receive 5 cubic centimeters.....	Do.
3.....	B.	5 cubic centimeters vaccine a.....	4 receive 10 cubic centimeters.....	Vaccine a
4.....			3 receive $\frac{3}{4}$ cubic centimeters.....	Vaccine b
5.....	A.	10 cubic centimeters vaccine a.....	4 receive $\frac{3}{4}$ cubic centimeters.....	Vaccine b
6.....	A.	5 cubic centimeters vaccine a.....	4 receive 5 cubic centimeters.....	Do.
7.....			4 receive 10 cubic centimeters.....	Vaccine a
8.....	A.	Checks.....	5 receive $\frac{3}{4}$ cubic centimeters.....	Vaccine b

* 1 cubic centimeter is equivalent to $\frac{1}{16}$ gill or to $\frac{1}{16}$ fluid ounce approximately.

From this table it will be seen that the pigs received two injections each, eighteen days apart. Both lots were treated alike, while the quantity of liquid injected was varied somewhat. It will also be noted that some pigs from both lots received only vaccine a both times.

After the first injection and as a result of it one pig in compartment 5, belonging to lot A, died nine days after the injection. The spleen contained hog cholera bacilli. Thus but one out of thirty succumbed to vaccine a, and in this case death may have been due to the accidental puncturing of a vein under the skin by the needle of the hypodermic syringe, by which means the bacilli may have been injected into the blood. This procedure is quite invariably fatal when large doses are used, as will be seen from the details of the experiment to be reported further on. Fourteen days after the second inoculation a second animal in the same compartment died, evidently as a result of it, since hog cholera bacilli could still be detected in the internal organs. Thus two out of thirty were killed by the inoculation, or 6 $\frac{2}{3}$ per cent., a proportion rather high for any method destined to have any practical value. But the problem before us now was to see whether any method of subcutaneous inoculation could be relied upon to give sufficient immunity to resist the natural disease. A method sufficiently severe to lead to the death of 6 $\frac{2}{3}$ per cent. of the vaccinated animals should therefore in the sequel prove specially efficacious for those animals that survived it. This, however, did not prove to be the case.

Of the control animals two from compartment 8 died sixteen and twenty-one days, respectively, after the vaccinated animals had received the second injection of the vaccinal culture. In one there was found diphtheritic inflammation of the middle portion of the small intestines, in the other the mucous membrane of the large intestine was more or less inflamed. In neither case, however, could hog cholera bacilli or any other bacteria be detected in the internal organs. It might be inferred that this compartment had been infected by the vaccinated pigs. It will be seen, however, that the neighboring compartment was left empty and the greatest care was taken not to use utensils indiscriminately. Moreover the evidence of

hog cholera, the presence of the bacilli in the body, was not obtainable. Meanwhile the check pigs in compartment 1, adjoining the vaccinated lot in compartment 2, showed no signs of disease.

It should also be noted that all four deaths were from lot A, the pen-fed pigs. Lot B stood the vaccination without any accident, and the checks remained well till the time of exposure to the natural disease. The effect of the injections manifested itself in general by a slight indisposition and a refusal to eat the daily ration for one or two days. The place of injection showed in most cases a subcutaneous tumor from 1 to 2 inches long.

The exposure to diseased pigs.—The two injections or vaccinations, as may be seen from the table, were made October 18 and November 5, 1889. On December 19, about one and one-half months after the last injection, the pigs were exposed to the disease. At this time there were twenty-three of lot A, of which seven were checks or control animals and sixteen vaccinated, and twenty-one of lot B, of which seven were checks and fourteen vaccinated; so that there were in all twenty-eight vaccinated and fourteen control animals to be exposed.

The animals in the different compartments, hitherto kept apart, were allowed to mingle by removing the partitions and thus making one large pen. At the same time eight infected and diseased pigs were placed in the pen with the rest. These had been infected on the station from an outbreak carefully studied, from which swine plague could be excluded with certainty. That the introduced disease was sufficiently virulent is shown by the fact that all eight infected pigs died between December 20 and December 27, at the rate of about one a day, beginning the day following their mingling with the vaccinated and control animals.

The result of the experiment was curious and quite unlooked for. The exposed pigs began to die on the 28th of December and continued to succumb until February, when apparently all the susceptible animals had been weeded out. The status of the experiment February 1 was as follows:

Of the lot of pen-fed pigs only one animal died, and this one of the check animals. It had been small and unthrifty before the exposure, and at the autopsy besides the rather mild hog cholera lesions there was a general anæmic condition manifest. Hence practically all of lot A resisted the disease, control animals included. The infection had been too mild for them.

With the other lot of pigs the case was different. At the beginning of the exposure there were fourteen vaccinated and seven control animals. At this time (February 1) there were left but three vaccinated and one control animal. The disease had made no discrimination between the treated and the not treated and had killed seventeen out of twenty-one. Of the whole lot remaining all were thriving excepting two or three, which were stunted in growth.

The inference to be drawn from these results is that the subcutaneous inoculations had little or no effect on the course of the disease. For lot A the disease was too mild, for lot B it was fatal in spite of the vaccination. This is practically the conclusion arrived at in 1886 when the experiments gave no better results than those just quoted. It may be possible that, by increasing the quantity of the culture liquid and the number of inoculations, a point may be reached at which immunity is produced. But such modification besides endangering the life of the animal would be too tedious and expensive to be of practical value.

There are some other not unimportant inferences to be drawn from this experiment. They bear upon the methods employed in testing the truth or falsity of subcutaneous vaccination and the evidence that can be adduced in its favor.

Had we chosen the pen-fed pigs to be vaccinated and the pasture-fed pigs as control animals we might have reached the erroneous conclusion that our vaccination was a complete success. Or had the circumstances been just the opposite—had the pasture-fed pigs been used for vaccination, the pen-fed for checks—we would have seemed justified in concluding that vaccination or preventive inoculation is not only a failure but predisposes swine to the natural disease. Neither of these inferences is correct, however, as the experiment proves. We should therefore be extremely cautious to accept any conclusions in regard to matters of such importance without the results of carefully conducted experiments before us. Experiments conducted in the field have at best but a partial value, since the disease may be introduced into a given herd or not depending on circumstances over which no proper control can be exercised, or else if the disease appears the animals are of different ages and of different degrees of health or else not exposed to the same dangers, etc.

Thus this experiment as well as those of former years afford sufficient evidence for the conclusion that the subcutaneous injection of culture liquid containing hog cholera bacilli is not capable of protecting swine from hog cholera.

In order to determine the effect of the vaccination and exposure upon the surviving pigs their weight was roughly estimated February 1. Of lot A the six control pigs had an average weight of 105 pounds each, the fifteen vaccinated ones about 93 pounds. The individual weights varied from 60 to 160 pounds, the heaviest being a control animal. Of lot B the three surviving vaccinated animals weighed on an average 84 pounds each, and the surviving check or control animal 105 pounds. The vaccination had thus the effect of slightly reducing the body weight in comparison with the control animals.

A few additional experiments were made with this lot of pigs which may be very briefly summarized:

March 18, 1890.—One cubic centimeter of a peptone-bouillon culture of the hog cholera bacillus was injected into one of the crural veins of two control and four vaccinated pigs, all from lot A. Of these six animals one control died six days later. The others recovered. This showed that some immunity had been gained by the vaccination.

April 18.—Six other pigs from lot A, two control and two vaccinated animals were fed each with nearly a quart of viscera from hog cholera cases. All survived.

April 29.—Another and final test was made by taking the five pigs of lot A, which had survived the intravenous injection of March 18, together with four others of the same lot and two of lot B, not thus treated March 18, and injecting into the crural vein another dose of bouillon culture of hog cholera bacilli. Three of those which received the injection of 1 cubic centimeter March 18 now received the large dose of 5 cubic centimeters. All the rest received $2\frac{1}{2}$ cubic centimeters.

Of these eleven animals thus inoculated three died within two, four, and forty-two days, respectively, after the inoculation. These three belonged to the lot of six which had not previously received

the intravenous injection. The other three survived. Expressed in another form, of those which had received the intravenous injection March 18 100 per cent. survived; of those which had not received it 50 per cent. survived. Of the three which died, the two which died in two and four days after the injection belonged to the original check animals, the one which died forty-two days after was a vaccinated animal.

These last tests lead to the inference that injections of hog cholera bacilli into the veins in small quantity protects the animal against injections of large doses ordinarily fatal.

The history of the surviving vaccinated animals up to November 1, 1890, may be given very briefly. They were kept in the same pens in which they had been exposed to the disease. Three died subsequently, two being in very good condition at the time of death. In one (June 22) there was a rupture of the cesophagus at its insertion into the stomach, permitting the contents of the stomach to enter the chest cavity. The second (September 3) was not examined. The third died from enlargement and softening of the bones of the head, impeding respiration. The remaining animals weighed from 140 to 280 pounds apiece. Those that received the injections into the veins were the poorest in weight.

AN EXPERIMENT TO TEST THE VALUE OF INJECTIONS OF HOG CHOLERA BACILLI INTO THE VEINS AS A MEANS OF PRODUCING IMMUNITY.

The preceding test had shown that two injections of hog cholera bacilli under the skin had no appreciable effect in protecting swine from the disease itself. Subsequent experiments with the same lot of animals proved that when small doses of hog cholera bacilli are injected directly into a vein the animal so treated is able after a time to resist fatal doses administered in the same manner.

The plan laid out for this experiment was to inject into a vein of the leg a very small quantity of culture liquid containing hog cholera bacilli to begin with; then after a certain period of time, depending on the effect produced by the first inoculation, to inject a larger dose in the same manner, and perhaps a third dose still larger, using control animals to gauge the effect of the various doses on fresh pigs; finally, to expose these inoculated animals to the natural disease.

The actual experiment carried out may be briefly summarized: Twenty-five pigs were selected, and at the time of the first injection they were about seven months old, in good condition, and weighing from 75 to 90 pounds each. The culture employed was derived from an outbreak studied in 1889 and somewhat attenuated by age.

On August 23 thirteen pigs of this lot received the first injection. Five received one-eighth of a cubic centimeter of a peptone-bouillon culture, five one-quarter of a cubic centimeter, and three one-half of a cubic centimeter each. In every case the small dose was diluted with some sterile liquid, such as beef broth to bring it up to 1 cubic centimeter. On the following day all pigs were sick and in proportion to the dose received. This was shown by a refusal to eat, and lasted but one or two days.

On September 4, twelve days after the first injection, only one pig had lost weight. They were all inoculated in the same way with 1 cubic centimeter each, and in addition four fresh pigs with the same dose. After one or more days of slight illness following the inocu-

lation they all recovered, excepting the four fresh pigs. These grew thin and weak, and two died September 29.

On October 17 a final injection of 5 cubic centimeters was given to all surviving pigs and three fresh ones. The result of the inoculations is given in a more condensed form in the following table:

Table giving the results of intravenous inoculations of culture liquid containing hog cholera bacilli.

Pig. No.	August 23.	September 4.	October 17.	Remarks.
347	½ cubic centimeter.	1 cubic centimeter.	5 cubic centimeters	November 8, condition good.
348	do	do	do	November 8, stunted.
349	do	do	do	November 8, condition good, swelling and ulceration over left tarsus.
350	do	do	do	November 8, condition fairly good.
351	do	do	do	November 8, condition very good.
359	½ cubic centimeter	do	do	November 8, condition fair, crippled by swelling on feet.
364	do	do	do	November 8, condition good.
365	do	do	do	November 8, condition very good.
366	do	do	do	Dead October 21.
367	do	do	do	November 18, stunted.
256	½ cubic centimeter.	do	do	November 18, condition good.
357	do	do	do	Do.
358	do	do	do	November 18, condition fair, swelling and sores on all feet.
352	do	do	do	Dead October 20.
353	do	do	do	Dead September 29.
354	do	do	5 cubic centimeters	November 18, condition good, enlargement of left fore and hind feet.
355	do	do	do	Dead September 29.
361	do	do	5 cubic centimeters.	Dead October 21.
362	do	do	do	Dead October 23.
363	do	do	do	Dead October 20.

From this table we learn that the three last control animals died three, four, and six days, respectively, after the inoculation. This indicates a decided immunity on the part of those which received the two previous injections, since but one of these thirteen succumbed to the last inoculation on October 21, or in other words, 100 per cent. of the last control animals and but 7 per cent. of the previously inoculated animals died as a result of the last injection (which has thus far always proved fatal to pigs).

When we come to the four control animals of the second inoculation (Nos. 352 to 355 inclusive) which received 1 cubic centimeter to begin with, we find that two of these died as a result of the inoculation, the third died as a result of the last inoculation, and the fourth survived.

Although this method thus showed that pigs can be made more or less insusceptible to fatal doses injected into the veins, it is not as yet proven that it will eventually prevent the treated animals from acquiring the disease in the ordinary way. We have thus far been unable to expose these animals, since no outbreak has been found during the fall within reach to furnish the starting point at the Experiment Station.

Another point deserves consideration, and this is the effect of this method of inoculation. If we examine the remarks appended to the twelve cases which were inoculated three times, we learn that only seven are in good condition, two are stunted and small, and three are affected with enlargement and ulceration of the feet (from

the carpal and tarsal joints down) though otherwise in good condition. These injuries are most likely the result of the inoculations, which one it is impossible to state, and may be directly due to the injected bacilli lodged in the bones perhaps and causing their destruction. How much damage will be done thereby can not be surmised at this time.

SWINE PLAGUE.

The standpoint of pathologists and students of infectious diseases both in man and animals at the present time is that two diseases must be regarded as identical or dissimilar according as the causes which produce them are the same or different. Two maladies in many respects the same are yet different from one another if the bacteria which produce them are different. Not only is this standpoint theoretically correct but sound also from a practical point of view, for the simple reason that only an exhaustive study of the causes of disease can eventually help us in suppressing them. While pathology has done but little in the treatment of infectious diseases of man and animals, most authorities being opposed to any treatment as useless and dangerous, it has already done much in formulating rules for the prevention of such diseases by tracing the insidious ways by which diseases are carried from place to place and introduced into herds of animals, by studying the nature of the virus, its vitality under various conditions, and the agents which are capable of destroying it.

All these important facts result from the study of the disease-germ in the laboratory, in the diseased animals, and in nature. Hence it follows that the disease-germ is the most important factor to be studied before other problems can be solved and before any sound information concerning the disease itself is obtainable. It also follows from these considerations that it is of essential importance to recognize the specific disease-germs wherever they may be found. This study of bacteria or bacteriology lies therefore at the basis of all investigations of infectious diseases and upon it subsidiary investigations relating to vaccination, inoculation, and treatment must rest.

Two infectious diseases of swine have been recognized in the investigations of the past five or six years, denominated, respectively, hog cholera and swine plague. The specific bacteria which cause them, and which can be made to reproduce them by inoculation, are readily distinguished by any novice in bacteriological studies. Their differences are sufficiently pronounced to demand careful separate investigations, although the diseases themselves may be easily confounded and may occur side by side.

It has been maintained in some quarters that this position of the Bureau of Animal Industry in insisting upon the existence of two distinct infectious swine diseases is wrong and that there is but one disease in the country demanding attention. This latter position may be due either to inability to distinguish between the germs causing these diseases, to inability to find them in diseased animals by not applying appropriate methods, or else to the nonexistence of one of these diseases in that part of the country where the investigations were made.

No amount of time and labor has been spared in the study of these two diseases, especially swine plague, in order that a thorough knowledge of its nature might be obtained. During midsummer of

this year we had the good fortune to find an outbreak of swine plague on the coast of New Jersey, several miles from Pleasantville and Atlantic City. The owner of the herd in which the disease had broken out, Mr. Joseph Young, gave us all the assistance in his power and freely sacrificed his animals for the purpose of investigation.

The history of the outbreak may be stated very briefly as follows: In May of the present year the owner purchased two lots of pigs from a dealer, numbering ninety-seven in all. At the time of the purchase more or less coughing was noticed among some unthrifty animals in the lots. On the farm they were kept on dry, sandy soil, and fed with hotel slops from Atlantic City. The coughing did not entirely disappear, and on July 1 they began to die. Up to July 19 thirty-four had perished. July 20 four died, July 21 seven died, and on July 22 eight died. These few facts indicate a very virulent and rapidly fatal disease. It was without doubt brought with the pigs themselves, as there had been very few pigs and no disease upon the farm for years, nor was any disease reported among swine in the vicinity though fed and kept in the same way.

The symptoms noticed by the owner were coughing, loss of appetite, and emaciation. Vomiting was a common occurrence. The sick animals were in the habit of straying and hiding themselves in out-of-the-way places and under bushes. Some died within three to five days after the first symptoms of disease; others lived a few days longer. Some died suddenly without manifesting any signs of disease.

From this herd about seventeen animals were examined after death. Ten of these were examined on the farm between July 21 and 23 inclusive and cultures made from the internal organs of six. This part of the work could not be done very thoroughly, owing to the primitive facilities and the innumerable insect pests on the farm. The results of this work indicating that we had an outbreak of swine plague instead of hog cholera to deal with as we had anticipated, it was deemed advisable to make a more thorough investigation of this disease. Dr. Kilborne was therefore directed to return alone to this farm July 28, and send to the Experiment Station at Washington some sick animals where the disease could be more carefully investigated in connection with the laboratory. On the farm two more autopsies were made on dead pigs and five diseased ones sent by express to the Experiment Station. Of these latter one died on the 1st, three on the 3d, and one on the 5th of August. Subsequent information from the owner showed that only seven out of the entire herd had survived the infection, *i. e.*, about 8 per cent.

It would be out of place in this brief report to go into detail concerning the appearance presented on *post-mortem* examination of the affected animals. In general both lungs and intestines were diseased and the impression made upon the writer at first was that of an outbreak of hog cholera. The disease resembled very closely that studied in Iowa in 1888, and the belief at that time on making the *post-mortem* examination in several herds was that the disease was hog cholera in some herds and swine plague in others. As in the Iowa disease, so in this New Jersey outbreak, the impression that the disease was hog cholera was entirely dispelled by the bacteriological work, as will be shown further on.

As regards the lungs, these were consolidated more or less in ten out of the seventeen cases. The hepatization was in most cases ac-

accompanied by pleurisy of varying degrees of severity and more rarely by pericarditis. The spleen and lymphatic glands were engorged with blood in the majority of cases. The mucous membrane of the stomach was usually deeply congested and in a few cases portions of the membrane had undergone mortification or necrosis.

In the large intestine there was disease in almost every case. This disease was manifested by a general reddening or by discoloration and pigmentation of the mucous membrane, by more or less extensive diphtheritic inflammation, causing superficial necrosis or mortification and by isolated ulcerations. In nearly all cases ulcers were present. It is not surprising that hog cholera and swine plague should be regarded as one disease when the lesions they produce are so much alike to the casual observer.

In order to determine the true nature of the disease it became necessary to learn whether hog cholera or swine plague bacteria were present or whether perhaps some third unknown germ could be regarded as cause of the disease. Cultures were, therefore, made from the organs of six animals on the farm and from five animals in the laboratory. The result of this laborious work was that no hog cholera bacilli were found in any of the cultures made from these eleven animals. They manifestly had nothing to do with the disease. In four out of the eleven cases swine plague bacteria were found distributed through the organs of the body. In the remaining cases most of the cultures from the organs remained sterile. A few contained other bacteria of a miscellaneous character, most of them known from former investigations.

The disease-producing power of the swine plague bacteria from this outbreak is well illustrated by the two following experiments made subsequently:

Inoculation of healthy pigs.—Two pigs three months old and weighing 40 pounds received into a vein of the leg 1 and 5 cubic centimeters, respectively, of a peptone-bouillon culture of the swine plague bacteria derived from this outbreak. The animal which had received 5 cubic centimeters was dead within sixteen hours. There was more or less redness of the skin, oedema of the lungs, commencing peritonitis, hemorrhagic condition of the kidneys, and congestion of the mucous membrane of the stomach. The pig which had received but 1 cubic centimeter died in four days. There was found at the autopsy extensive double pleuritis, pericarditis, and consolidation of a small portion of the left lung. The kidneys contained numerous abscesses. At the same time a third pig was inoculated by injecting 5 cubic centimeters of the culture liquid into the right lung. This animal died within twenty-four hours with pleuritis, beginning hepatization of the lungs, peritonitis, and pericarditis. These results are indicated to show how virulent the swine plague germ of this outbreak was and that the destructive activity of this germ is fully equal to that of the hog cholera bacillus.

In order to test the effect of feeding substances containing this germ the organs of six rabbits which had been inoculated with it were fed to two pigs. They showed no signs of disease. A subcutaneous injection of 5 cubic centimeters of culture liquid was likewise without effect. The negative result following these methods of introducing the swine plague germ into the body simply confirms former experiments of a similar character with swine plague germs from other outbreaks.

Exposure of healthy pigs to sick animals from this outbreak.—The five pigs sent to the Experiment Station were placed in a wooden pen with two healthy pigs. One of these died eleven days after with a large number of necrotic masses in the lungs, exudative inflammation of the pleura and pericardium, intense hyperæmia of the stomach, and portion of the large intestine. Swine plague germs were detected in lungs and intestines. The other pig exposed at the same time became very unthrifty and was killed several months later. No disease could be detected, but the weight of the animal at the time it was killed was but 25 in place of 70 or 80 pounds. Three other healthy pigs were placed into this pen, one of them while two of the diseased pigs were still alive, the remaining two when all of the original lot had died. These three exposed pigs also survived, but they became unthrifty and after several months they were all over 50 pounds behind in weight. The explanation of this condition is by no means obvious, although it would appear that the infection disappeared in great part from the pen with the death of the diseased animals and that more direct contact with such diseased animals is necessary to produce a fatal result in swine plague than in hog cholera.

Little need be said in this connection of the swine plague germ itself. It did not differ from the same germ obtained from various sources since 1886, and described in detail in the reports of the Bureau of Animal Industry issued since that date, excepting perhaps in its greater virulence. A very minute quantity of growth from cultures placed beneath the skin of rabbits proves fatal in less than sixteen hours. Its fatal effect on guinea pigs and mice is no less pronounced. These small animals are thus of great service to the pathologist in exactly gauging the virulence of the same germs from different localities.

The investigation of this outbreak of swine disease has once again demonstrated the existence of a highly infectious, extremely fatal disease, which can not be included under hog cholera, and which without difficulty may be ranked with hog cholera in economic importance to the farmers of the country.

Its mode of introduction into a herd is probably mainly through sick animals, which are suffering from the disease in a chronic form and are the remnants of other outbreaks sold by unscrupulous persons or those who are not aware of the dangers and losses to which they may subject owners of swine into whose herds these remnants are taken.

The disease still awaits a complete explanation of its various characters, however, more especially as to any other channels by which it may be transmitted from herd to herd, from animal to animal, and its capacity for thus transmitting itself, which capacity was very feeble in the disease after it had been brought to the Station. Meanwhile the same rules of prevention* and for the application of disinfectants apply to both swine plague and hog cholera, although there are points of difference which need not be dwelt upon in this connection.

TWO OUTBREAKS OF HOG CHOLERA.

Two other outbreaks of swine disease may be briefly mentioned, inasmuch as there was no difficulty in making the diagnosis of hog cholera.

* See Report of the Bureau of Animal Industry for 1887-'88, page 148; Bulletin on hog cholera, page 123; report of the Secretary of Agriculture for 1888, page 156.

A limited outbreak was reported as having occurred in the District of Columbia, a few miles from Washington City, during September. There were eight in the herd, all of which died with the exception of one, which was brought to the Experiment Station for examination. After lingering several weeks it also died. The most important lesions found were superficial necrosis of the ileum and about a dozen large ulcers in the large intestine. *The lungs were normal and in the spleen hog cholera bacilli were detected*, which produced by inoculation the characteristic disease in rabbits.

The disease was traceable to the Washington market, where the animals were purchased. This is not the first time that outbreaks in the vicinity of Washington have been traced to this source.

Another outbreak was investigated by Dr. E. C. Schroeder at Quantico, Virginia, during October, whose report may be briefly summed up as follows:

On October 28 Dr. Schroeder made *post-mortem* examinations of two pigs which had been dragged from the farms where they belonged to the common to be disposed of by the buzzards. One had been dead one or more days, the other was still warm, having died very probably only a few hours before. In the first animal were noted enlarged spleen, reddening of mucous membrane of the stomach, numerous ulcers in the large intestine. In the lungs were a few small collapsed areas, otherwise they were healthy.

In the second animal the lesions were practically the same. There was no consolidation of lung tissue as in the preceding case. From the spleen of this animal cultures were made and these contained only hog cholera bacilli, which produced in rabbits the peculiar and characteristic inoculation disease of the hog cholera germ.

Dr. Schroeder furthermore was informed that hundreds of pigs had perished of hog cholera this season. The manner of disposing of the carcasses mentioned above, as well as the custom there prevalent of allowing swine to roam at large over the country does not make this extension of the disease appear at all surprising.

INVESTIGATION OF E. A. V. SCHWEINITZ, PH. D.

The following is a brief account by Dr. E. A. v. Schweinitz of the chemical investigations conducted under the direction of the chief of the Bureau of Animal Industry into the nature and effects of the chemical products developed during the growth of the microbes of hog cholera and swine plague:

In January, 1890, the writer was appointed to take charge of the chemical work of the Bureau of Animal Industry and investigate the chemical side of the diseases of animals, especially hog cholera and swine plague. It was necessary first of all to secure laboratory room suited to this class of investigation. On account of the crowded condition of the offices of the Department, space was procured by partitioning off rooms in the Museum building. This laboratory was supplied with water, gas, and steam, the necessary working desks, apparatus and chemicals, and by April 1 it was in proper condition to begin the investigations.

HOG CHOLERA.

The first problem undertaken was the study of the culture liquids of the hog cholera germ. Investigations of recent years have shown

that when different disease germs are allowed to multiply in artificial nourishing media, as beef broth, they form substances which have the general composition of alkaloids and proteids, and give a number of the chemical reactions characteristic of these two classes of bodies. The alkaloids formed by germs are called, as a class, ptomaines, and the proteids, albumoses. Some of these substances, that have been isolated, are very poisonous in small doses; others only slightly so, or not at all. The fatal effects of a number of diseases which are known to be produced by specific germs are held to be due to the fact that the multiplication of the germ in the animal organism, just as when allowed to grow upon artificial media, forms large quantities of these poisonous alkaloids and proteids, which in their turn produce death.

This suggests the inquiry: If this be true can not these poisons be isolated by chemical methods and their exact nature and properties determined? Further, is it not possible by giving small doses of these poisons at a time to so accustom the animal organism to their effect that a subsequent large dose of the same poison, even when produced in the body by the active multiplication of the germ, would not result fatally? That this object may be accomplished by treating animals with sterilized artificial culture media, in which the germ had been allowed to grow for some time, was demonstrated by the work of this Bureau upon pigeons in 1887.

The problems for solution were:

(1) To isolate the chemical compounds, alkaloidal and albuminoidal, which the hog cholera germ forms.

(2) Determine whether one or more of these compounds exist in the artificial culture liquids.

(3) Which are the important ones?

(4) Will the isolated compounds produce immunity in animals from the disease of hog cholera?

(5) What is their exact chemical constitution?

(6) Are there known compounds of the same or similar composition, or one that can replace them?

(7) Can these compounds be made artificially?

(8) Can chemical inoculation be made practical, and if so, what is the minimum amount of substance and time required?

The results of the experiments permit of positive answers being given to all of these questions except the last so far as the disease of hog cholera is concerned, and only some details remain to be worked out.

After a number of experiments we found that acid beef infusion containing one half per cent. of peptone is the most satisfactory medium in which to grow the bacillus of hog cholera. Erlenmeyer flasks of 500 cubic centimeter capacity were used to contain the liquids, the mouths of the flasks being closed with a cotton plug, and after inoculation allowed to stand in the incubator at 37° C. for two to three weeks. The liquids had by this time become alkaline in reaction and careful examination showed that there was no contamination with foreign germs. In isolating the chemical products from these solutions the methods by which Brieger has obtained such excellent results were with slight modifications followed.

The culture liquid, after being neutralized with dilute hydrochloric acid, was evaporated on the water bath. The residue was then extracted with 96 per cent. alcohol and the filtered solution treated with mercuric chloride. A heavy crystalline precipitate was formed which

increased upon standing. After filtration this precipitate was treated with water, decomposed with sulphuretted hydrogen, and the mercury sulphide removed by filtration. From the filtrate, after removal of the excess of sulphuretted hydrogen and concentration, I was able to isolate cadaverine and methylamine. The filtrate from the mercuric chloride precipitate was freed from excess of mercury by sulphuretted hydrogen, and the mercury sulphide filtered off. The residue, after concentration of this filtrate, was extracted with absolute alcohol, the solution thus obtained showing the presence of a salt of an alkaloidal character. The reactions were as follows:

- With phosphomolybdic acid—light yellow precipitate;
- With bismuth potassium iodide—red needles;
- With phosphotungstic acid—a white precipitate;
- With potassium iodide and iodine—brown red precipitate;
- With platinum chloride—yellow crystalline precipitate;
- With gold chloride—yellow red crystalline precipitate.

Subsequently the use of mercuric chloride was omitted, and repeated extraction of the residue with alcohol alone substituted.

The double salt obtained with platinum chloride was submitted, after crystallization from 96 per cent. alcohol, to preliminary analysis, giving results which correspond to the formula, $C_{12}H_{12}N_4PtCl_4$. The free base I have not yet succeeded in obtaining in a pure form. The hydrochloride of this base is soluble in absolute alcohol as well as water, and can be obtained as needle-like crystals.

By treating the original culture liquids of the hog cholera germ with a large excess of absolute alcohol, a white flocculent precipitate was obtained, a portion of which was soluble in water and could again be precipitated by alcohol. By repeated treatment of this sort with water and alcohol a small quantity of an albuminoid body containing carbon, hydrogen, nitrogen, oxygen, and sulphur, was finally obtained. This substance, which we will call albumose, was dried over sulphuric acid in vacuo, giving white translucent crystalline plates. After drying it was still soluble in water, though dissolving with more difficulty. The water solution gave with platinum chloride an almost soluble precipitate, appearing under the microscope as needle-like crystals. The composition of this platinum salt shows it to be a substance allied in composition to peptone. As to the exact nature of this latter substance, whether it is a true proteid or belongs to the class of ferments, remains to be determined by subsequent study and investigation.

Brieger and Fraenkel (*Ber. Klin. Woch.*, 1890, No. 11), who have extracted a similar substance from culture liquids of the diphtheria, tetanus, and cholera germs, and Baginsky and Stadthagen (*Ber. Klin. Woch.*, 1890, No. 13), who obtained an allied body from cultures of the cholera-infantum germ, hold that the substances are proteids. Roux and Yersin (*Annales de l'Institut Pasteur*, 1890, p. 385), on the contrary, hold that the substances obtained by the precipitation with alcohol are ferments. Hankin (*British Medical Journal*, July 12, 1890, p. 65), who has also isolated a substance from cultures of anthrax possessing albuminoid properties, holds the same view as Brieger and Fraenkel, that the body in question belongs to the class of proteids.

In so far as our work upon the hog-cholera culture liquids goes, we are inclined to the opinion that we have to deal with albumoses, which can be heated in presence of acids to 70° without decomposition. I am preparing now a considerable quantity of this

albumose and hope to be able in a short time to have something more definite as to its exact nature. To be sure that the substance one is dealing with is absolutely pure is very difficult when it is a body of this nature, and only extended experiments can be regarded as conclusive.

As to the nature of the new ptomaine which has been isolated, we will not go into a discussion of its exact chemical composition until it is more definitely determined.

In order, however, to distinguish the active principles formed by the hog-cholera germ, I have named the ptomaines as a class sucholotoxins, and the new base sucholotoxin (from the Greek *Σοc*, a hog, *Χολέρα*, cholera, from *Χολή*, bile, and *Τοξικόν*, poison). To the proteid body I have given the name sucholoalbumin. These names will be used in referring to these bodies in the future.

Some experiments were made later, but may be inserted here, in regard to substituting some other material for peptonized beef infusion in furnishing nourishing media for the artificial cultivation of the germ. Potato broth, pea broth, and plain beef infusion have been used. In all of these the hog-cholera germ grows very vigorously, forming the ptomaines and albumoses, but not in so large a quantity as in the peptonized beef infusion.

Now, in regard to the toxic effect of the sucholotoxin and sucholoalbumin, active poisons for guinea pigs, in small doses, they are not. In large doses, corresponding to from 6 to 15 cubic centimeters of the culture liquid, death is produced in guinea pigs in from six to twenty-four hours. A small subcutaneous injection causes the animal to appear stupid and uncomfortable for a short time, fifteen minutes, produces a slight rise in temperature, necrosis of tissue, and ulceration at the point of injection.

It may be added here that in making these and all the following experiments special precautions were taken to prove that the material used was entirely free from germs. Cultures were always made from the substances used for injection.

The autopsy of a case resulting from poisoning with the ptomaines may be inserted here: Liver, pale and fatty; subcutaneous tissue over abdomen necrosed, and infiltrated muscle soft and friable. Other organs apparently normal.

The next point to be decided was: Can immunity be produced from hog cholera by previously treating the animals with these substances, isolated from the culture liquids? The results are recorded in the following experiments, which are very conclusive. For the laboratory experiments guinea pigs were used as being convenient to handle and susceptible to hog cholera. They have proved very satisfactory.

The first of our experiments that we will record were made with sucholotoxin.

Experiment I.—Two guinea pigs, each weighing about three-fourths of a pound, were treated with a solution of about 0.05 gram of sucholotoxin hydrochloride each. The solution was introduced under the skin of the inner side of the left thigh. Immediately after the operation the animals appeared uncomfortable, but were not made ill. For a few days there was a rise in temperature and also a slight swelling at the point of inoculation, which, however, disappeared in about five days, and the animals were then well.

Two more guinea pigs were now selected as checks, approximately of the same size and weight as those which had been treated, and the four animals were then inoculated with 0.1 cubic centimeter of hog cholera virus each (0.1 cubic centimeter beef infusion peptone culture one day old, plus 0.2 of sterile, normal salt solution). This is the dose which previous experiments made in the Bureau had shown to be the proper quantity to kill a guinea pig in from eight to ten days. The inoculations with the virus were also made subcutaneously in the thigh. The checks died in eight and nine days.

Of the animals which had been first treated with the substance mentioned, and afterwards inoculated, one died two days after the last check. The other guinea pig of this set was quite ill for ten days, with a large swelling at the point of inoculation. This finally opened and healed, and the animal was quite well within three weeks after the inoculation, and has continued so to date—five months.

Experiment II.—The next series of experiments were made with sucholalbumin from beef infusion peptone culture media.

Two guinea pigs were again selected and treated with about 0.005 gram each of sucholalbumin. There was a slight rise of temperature in the animals and the formation of a small, hard lump at the point of injection. This disappeared by the eighth day and the animals were quite well. Two more guinea pigs were now taken as checks, and all four animals were inoculated with 0.10 cubic centimeter of hog cholera culture. The checks died within seven days. The *post-mortem* appearances were practically the same as those noted in the first series. The two guinea pigs which had been treated with the sucholalbumin died ten days after the checks. This indicates considerable resistance to the disease. Several other experiments were made by treating guinea pigs with the albumin in varying quantities, all showing resistance, and subsequently immunity.

Experiment III.—Three guinea pigs were treated with sucholalbumin, 0.1 gram being given to each, subcutaneously in the thigh. The albumin for two of the animals was derived from cultures containing blood serum, the albumose given to the third was from ordinary beef infusion peptone culture. Ugly ulcers formed at the point of inoculation, which healed, however, in from ten to fourteen days, and the animals, with the exception of a slight rise of temperature, were well.

Two checks were again selected and the five animals were inoculated with 0.10 cubic centimeter hog cholera virus. The checks died, respectively, in eight and ten days from hog cholera. The animals which had received the preventive treatment were slightly ill for a few days with swelling at the point of inoculation, which finally opened and then healed nicely, and within a week the guinea pigs were well.

Three weeks after the inoculation one of these animals was chloroformed and examined *post-mortem*. Not the slightest scar could be discovered, all the organs appeared perfectly normal, and no germs were found.

Experiment IV.—Four guinea pigs were treated, two with a mixture of sucholotoxins, two with sucholotoxin and albumin. The injections were made as before, subcutaneously in the thighs, and at intervals extending over a period of four weeks. The sore caused by each injection was allowed to heal before the next one was made. After the animals had recovered from the last treatment two checks were selected, and the six were each inoculated with one tenth cubic centi-

meter hog cholera virus. The checks died, one in eight and the other in ten days, the *post-mortem* examination showing characteristic hog cholera lesions. The animals having the preventive treatment were ill about four days, those that received only the sucholotoxins being more dull than the others. There was also slight swelling at the point of inoculation with the germ, which subsided in ten days, after which the animals were perfectly well, and have remained so four months.

Experiment V.—Six guinea pigs were inoculated for this experiment, two with solution of the sucholotoxin and four with a solution of the mixed sucholotoxins. The sucholotoxin solution produced only slight local lesions, while the mixed toxins caused ulceration at the point of injection which did not heal for two weeks. The animals having by this time recovered, the test experiment with hog cholera virus was tried. Four of the animals mentioned above were taken—two from each set—and also two checks, and the six were inoculated. The checks died in eight and nine days, the autopsies showing the characteristic conditions of death from hog cholera. Those that had the preventive treatment were ill and dull for from four to six days after the inoculation. At the point of inoculation there was also some swelling and infiltration, very slight, however, compared with the similar swelling on the checks. In the treated animals the swelling sloughed and healed, and within ten days after the inoculation they were perfectly well. To test the resistance of the animals that had been treated by this method to ordinary exposure the following experiments were conducted.

Experiment VI.—Two guinea pigs that had received the preventive treatment, two blanks—i. e., animals that had received no treatment—and two check animals that were inoculated with hog cholera virus were placed in one large cage. The checks became ill and died in eight or nine days from hog cholera. During this time the cage was cleaned only three times, so as to give full and free opportunity for contagion. One week after the checks had died one of the blanks became ill, and died within ten days. The autopsy showed hog cholera lesions. The second blank became ill a few days after the first blank succumbed, and died within thirty days. The animals which had the preventive treatment are now and have been quite well, though continually exposed for five weeks to every opportunity for contagion.

These experiments have answered conclusively the first five propositions named in the beginning of this report, and brings us to the sixth. Can these substances be replaced by one of allied composition and character that we already know and can prepare synthetically in the laboratory? The experiments also give an affirmative answer to this problem. If the ptomaines when introduced into the system produce certain changes, or induce certain powers of resistance on the part of the animal to subsequent doses of the poison, then it is possible that not only this one particular alkaloid but several, belonging to the same class and of approximately the same chemical composition, should produce similar effects when introduced into the system, as the true ptomaine extracted from the culture liquids, and subsequently immunity should result, when the animal should be exposed to the virus of hog cholera. I thought of a substance which could be prepared without difficulty, and which I will refer to as pure chemical. Some of it was prepared and the solution used for injection. The injections and treatment were con-

ducted in the same manner as already recorded for the other guinea pigs, three animals being used for this experiment.

Experiment VII.—There was a slight rise in temperature of the animals and swelling and soreness at the point of injection. After this had healed these animals and two checks were inoculated with one tenth cubic centimeter of hog cholera culture. The checks died in eight and nine days. The animals which had been previously treated became ill, two dying five and six days after the checks. The third entirely recovered.

Experiment VIII.—One guinea pig was treated with a solution of the chemical in the same way as the previous experiment, except that a somewhat larger dose was given. Two pigs were again taken for checks, and the three inoculated with 0.1 cubic centimeter hog cholera culture. The checks died in six and seven days, respectively, of hog cholera; the treated animal recovered entirely. In the treated animal there was a slight swelling at point of inoculation with the germ, but this gradually decreased, finally opened, sloughed and healed within a few days after the death of the checks.

Experiment IX.—Four guinea pigs were treated with a solution of the chemical substance. This modification of the injections was adopted, i. e., very small quantities were used at a time and the dose repeated every day. The local irritation was in this way much diminished and what soreness was produced healed more rapidly. Two checks were taken and the six animals inoculated with 0.1 cubic centimeter of hog cholera culture. The checks died of hog cholera in eight days, one vaccinated pig in thirteen days, the others recovered.

Experiments were also made in producing immunity with the potamoines obtained from the potato, pea, and simple beef broth cultures, which resulted successfully.

Two of the guinea pigs which had recovered from experiment IV, and two that had recovered from experiment V, were now reinoculated with double the dose of hog cholera virus used in the first test. Checks were taken and given one half dose in quantity of the virus. These died in eight and nine days. The other pigs were a little stupid for a day or so, but at no time ill, and have since remained perfectly well.

One pig from experiment V, and one from experiment III, were chloroformed four or five weeks after their recovery, and an autopsy made. All the organs appeared perfectly normal, not even a scar being left at the point of injection, and the immunity produced was therefore perfect.

Our experiments had now proved that the chemical principles produced by the germ could be isolated; that their injection into guinea pigs rendered the animals secure against an attack of hog cholera, and that we have at hand a compound fairly easily obtained which will give the same results in securing immunity.

EXPERIMENTS UPON HOGS.

The next question was: Will these same materials produce immunity in hogs, and can the production of immunity by this method be made practical? The experiments were carried on at the Annual Experiment Station of the Bureau. The injections were made by Dr. Kilborne, who recorded the notes upon the condition of the animals. Necessarily the hogs were not as easy to handle as the guinea pigs, and the first experiment, which is the only one complete at this

time, is not conclusive; but considering the time which must elapse before a question of this sort can be positively decided we regard the ultimate practical solution of the problem only as a question of detail, which a few more experiments will enable us to decide.

In order to test the value of this ptomaine, which had proved so satisfactory for guinea pigs, and also of the synthetically prepared chemical compound upon hogs, the following experiment was conducted:

Nine pigs, black Essex grade, aged three months, were selected, four of them being placed in one pen and five in another.

Pig No. 374, aged three months, weight 60 pounds, treated on July 26 with solution of the ptomaine, 18 cubic centimeters of solution were used, the injection being made subcutaneously at three points. On July 30 there was a large swelling at seat of injection. By August 8 this had sufficiently healed to permit of injecting more of the solution of the ptomaine. The dose was repeated on August 16. August 20 there was swelling (lumps the size of a hen's egg), at the points of injection. These sores had healed by sloughing, and on September 9 the animal was inoculated in the femoral vein with 2 cubic centimeters of beef infusion peptone hog cholera culture, one day old.

Pig No. 375, aged three months (weight 60 pounds), was treated in the same way as pig No. 374, with solution of the ptomaines, and showed the same soreness and symptoms. On September 9 inoculated with 2 cubic centimeters of hog cholera beef infusion peptone culture one day old.

Pig No. 376, aged three months (weight 50 pounds), treated with ptomaines as other two and inoculated September 9 with 2 cubic centimeters beef infusion peptone hog cholera culture.

Pig No. 377, aged three months (weight 50 pounds), treated on same dates as the above with a solution of the synthetical compound and inoculated September 9 with 2 cubic centimeters beef infusion peptone hog cholera culture one day old.

Pig No. 378, aged three months (weight 45 pounds), treated in same way as pig No. 377, and inoculated September 9 with 2 cubic centimeters beef infusion peptone hog cholera culture.

Pig No. 379, aged three months (weight 60 pounds);

Pig No. 380, aged three months (weight 69 pounds);

Pig No. 381, aged three months (weight 50 pounds);

Pig No. 382, aged three months (weight 50 pounds), were all inoculated in the vein on September 9 with 2 cubic centimeters beef infusion peptone hog cholera culture one day old. These served as checks to Nos. 374 to 378, inclusive.

The results of this experiment were that of four checks three died, two in four and five days after the inoculation with the germ, the third in seventeen days, and the fourth check recovered.

Of the three pigs treated with the ptomaine one recovered, two died in five and six days after the inoculation.

Of the two pigs treated with the synthetical compound one died in thirty-nine days after the inoculation and fourteen days after the last check; the other one recovered entirely. Though this experiment is not conclusive, it certainly indicates that the pigs which had been treated offered considerable resistance to the disease, and that the synthetical compound is more effective than the ptomaine obtained from the culture liquids.

Had a somewhat larger quantity of the ptomaines been used for treatment, and the injections been made in smaller quantities, extending over a longer period of time, it is probable that all the treated animals would have recovered. At any rate we are sufficiently encouraged to continue the experiments. I may take occasion here to mention the valuable assistance rendered me by Dr. V. A. Moore in connection with the bacteriological work, autopsies, etc., and by Dr. Theobald Smith in allowing the use of the facilities of the bacteriological laboratory in his charge, and also the uniform kindly encouragement of Dr. Salmon, Chief of the Bureau.

SWINE PLAGUE.

While awaiting the results of further experiments upon hog cholera it was thought well to begin a study of the swine plague cultures, with the object of obtaining from them albuminoid and alkaloid poisons. The swine plague germ grows but slightly in the ordinary beef infusion culture. Dr. Moore, however, found that if instead of making a simple beef infusion a beef broth was prepared by boiling the meat the growth of the swine plague germ in this liquid was much more abundant. Alkaline media of this description were therefore used, 1,000 cubic centimeters in Erlenmeyer flasks being inoculated and kept in the incubator for two days at a temperature of 37° C. The growth of the germ was by this time very perceptible. The contents of the flasks proved to be uncontaminated. When opened a disagreeable, pungent odor was noticed.

After filtration about eight times its volume of absolute alcohol was added to the solution, and a considerable amount of a white flocculent precipitate was obtained. This, after settling, was filtered off, redissolved with water and again precipitated with absolute alcohol. The precipitate was thoroughly washed with absolute alcohol and dried over sulphuric acid in vacuo. A white translucent mass was thus obtained, with difficulty soluble in water and having properties of an albuminoid or proteid body. The filtrate from the albumose was neutralized with hydrochloric acid evaporated to dryness, and the residue extracted with absolute alcohol. This alcohol extract gave alkaloidal reactions with mercuric chloride, phosphomolybdic acid, platinum chloride, etc., showing the presence of a ptomaine. The double platinum salt of this body I have prepared, but have not at this writing been able to make a satisfactory analysis of it. I have demonstrated, however, the existence in the culture liquids of the swine plague germ of a ptomaine and albumose. The name suplagatoxin may be given to the ptomaine (from the Greek *εχ*, a hog, *πληγή*, plague, and *τοξικόν*, poison), and suplagoalbumin to the albumose. This would be distinctive from the *hog cholera* ptomaines. While purifying a larger quantity of these substances in order to make a closer study of them chemically, I thought it advisable to use the material at hand for making some experiments in the production of immunity in guinea pigs from swine plague by preventive treatment. Previous to this Dr. Moore had made a number of inoculations of guinea pigs with swine plague, which showed that one one-thousandth of a cubic centimeter of beef infusion peptone culture of swine plague one day old, was sufficient to kill a guinea pig in from twenty-four to forty-eight hours. Further, in order to see if the treatment which proved satisfactory for producing immunity against hog cholera might have any effect in retarding the disease of swine plague, two guinea pigs that had been submitted to the preventive treatment for hog cholera, but never exposed by inoculation, were inoculated with one one-thousandth of a cubic centimeter of beef infusion swine plague culture one day old. Both animals succumbed in forty-eight hours to the disease of swine plague. Two guinea pigs that had been subjected to the preventive treatment, then inoculated with hog cholera and recovered and were perfectly well, were inoculated with one one-thousandth of a cubic centimeter each of beef infusion peptone swine plague culture one day old. Both died, as was expected, in forty-eight hours. These experiments serve further to demonstrate, if proof is necessary, that the diseases

of hog cholera and swine plague are distinct, and that an animal that has had the hog cholera and recovered is still susceptible as ever to the swine plague.

Experiment XII.—Two guinea pigs were selected, and on three successive days .0030 gram of swine plague albumose was injected subcutaneously in the thigh. About .0010 gram of substance was given at each injection. There was a slight swelling at the point of injection, which disappeared in four or five days and the animal appeared well. Two checks were now taken and the four inoculated with one one-thousandth of a cubic centimeter swine plague culture. The checks died, one in forty-eight hours and the other in thirty-six hours. The treated pigs appeared a little stupid for a day or two and then recovered entirely.

Experiment XIII.—Two guinea pigs were treated with a solution of the ptomaine extracted from the culture liquids. The injections were made subcutaneously in the inner side of thigh, the quantity of ptomaine used corresponding to about 15 cubic centimeters of the culture medium. There was a slight swelling and soreness at the point of injection, but otherwise the pigs appeared well. These, together with two checks, were inoculated with one one-thousandth of a cubic centimeter of swine plague culture. The checks died of swine plague. One of the treated animals died in thirty-six hours. The autopsy, however, showed but few marked characteristics of swine plague. At the point of inoculation there was a slight infiltration. Blood vessels in heart much injected; liver slightly reddened. Bladder distended with urine. Otherwise the organs were normal. Coverglass from spleen and liver showed *no swine plague germs*, but cultures from the liver showed that the swine plague germ was present. The other treated pig died five days after the checks, or eight days after the inoculation.

The ptomaine, therefore, produced resistance and a large dose would probably give immunity.

These few experiments, following the more extended ones upon hog cholera, prove conclusively that both these diseases can be prevented in guinea pigs by chemical inoculation. The experiments upon swine plague will be extended and a careful study made of the ptomaine and albumose produced by this germ, and their effect upon hogs.

Hankin holds that albumose is the one and principal factor in the production of immunity, and that the reason more results have not been secured in this direction is because the proper material has never been used. We think, however, that the albumose is only an intermediate product of the germs and the final and most fatal effect of the disease results from the ptomaines. At any rate the experiments upon hog cholera lead to the conclusion that while a mixture of the albumose and ptomaine seems to produce greater immunity than either substance alone, nevertheless when used separately they are of about equal value.

MISCELLANEOUS.

In addition to the study in connection with the disease just recorded the writer has given some little attention to the presence of tyrotoxin in milk. In May a sample of milk from Maryland came into his hands which was supposed to have caused the sickness of a number of children. The symptoms as given indicated a possible tyrotoxin poisoning. The milk was examined for the poison, but

the latter could not be detected. Some months after this same cheese, which had produced sickness in this city, and two lots which had caused illness in Ohio, were received. In all three cases the questionable tyrotoxin was blamed for the sickness. I could not, however, establish the presence of tyrotoxin in any instance by the methods prescribed by Vaughan. This led me to repeat one of Vaughan's experiments, which should have given me considerable quantities of tyrotoxin. Half a gallon of fresh normal milk was placed in a loosely stoppered glass jar and allowed to stand at the temperature of the room for three months during the summer. At the end of this time it was examined for tyrotoxin, but the test failed to establish its presence. From this milk as well as from the sample of cheese Dr. Moore isolated several different germs, but other more important work has prevented a closer study of these and their products.

Our own experiments, supported by the negative results of a number of other chemists, force us to conclude that the toxic principles of poisonous cheese and milk have not been yet sufficiently studied, and that there is here a very important field for further investigations.

A number of other unimportant examinations and analyses have been made, but the facts established in regard to hog cholera and swine plague are the important results of our six months' work.

Tabulated experiments in producing immunity from hog cholera in guinea pigs

No. of experiment.	Material used for treatment.	Hog cholera virus used for each animal.	No. of animals used.	No. of checks.	No. of days between inoculation with virus and death of checks.	Result in treated animals.
I.....	Sucholotoxin.....	Cc. 0.10	2	2	8 and 9	One died in 11 days; recovered.
II.....	Sucholalbumin.....	0.10	2	2	7	Died in 17 days; great resistance.
III.....	do.....	0.10	2	2	8 and 10	Recovered; immunity.
IV.....	1. Sucholotoxins..... 2. Sucholotoxin and albumin.....	0.10 0.10	2	2	8 and 10	Do.
V.....	1. Sucholotoxin..... 2. Sucholotoxins.....	0.10 0.10	2	2	8 and 9	Do.
VI.....	Sucholotoxins.....	0.10	2	2	8 and 9	Blanks died in 13 and 14 days; others not affected; immunity.
VII.....	Pure chemical.....	0.10	2	2	8 and 9	Two died in 13 and 14 days; third recovered; immunity.
VIII.....	do.....	0.10	2	2	6 and 7	Recovered; immunity.
IX.....	do.....	0.10	4	2	8	One died in 13 days; others recovered; immunity.

EXPERIMENTS UPON HOGS (ESSEX GRADE).

X.....	Sucholotoxins.....	2	2	4 and 5	Two died in 5 days.
XI.....	Pure chemical.....	2	2	4 and 17 days; one recovered.	One in 30 days; two recovered; resistance.

EXPERIMENTS IN PRODUCING IMMUNITY FROM SWINE PLAGUE IN GUINEA PIGS.

XII.....	Suplagatoxin.....	1 cc 1 cc	2	2	2 and 3	Recovered; immunity.
XIII.....	Suplagoalbumin.....	1 cc 1 cc	2	2	2 and 3	One in 3 days, the other in 8 days.

REPORT OF THE CHEMIST.

WASHINGTON, D. C., *December 22, 1890.*

SIR: I have the honor to submit herewith a brief report of the work of my Division during the past year.

I am, respectfully,

H. W. WILEY,
Chemist.

Hon. J. M. RUSK,
Secretary.

STUDIES ON THE SEPARATION OF SUGAR FROM SORGHUM
JUICES.

For many years attempts have been made by the division to secure a more perfect separation of the sugar from the non-sugars in sorghum juices. Extensive practical experiments were made in this direction at Fort Scott in 1886, in the practical application of the process of carbonatation.

This process consists in the addition to the mill or diffusion juices of large quantities of lime, from 1.5 per cent to 3 per cent of the weight of the juice, according to the amount of impurities present. The lime is then precipitated by blowing through the liquid a current of carbonic acid derived from a limekiln or coke furnace, or even from the chimneys of the boiler furnaces. The result of this process was entirely successful in respect of the yield of sugar, but on account of the blackening of the molasses, which was at that time a valuable by-product, it met with no favor from sorghum sugar manufacturers, but on the contrary was condemned by them as being unsuitable for the purpose.

Subsequently extensive laboratory experiments were made looking to the precipitation of the crystallizable sugar in the juices as sucates of lime. The process employed in the Steffen method of separating sugar from beet-root molasses was the one tried for this purpose. While these experiments were successful in separating the crystallizable sugars in the form of a precipitate, they were not wholly so in securing a separation from the non-sugars, the greater part of which were also thrown down as lime compounds or carried down mechanically with the precipitated sugar. This process was, therefore, abandoned as not being practical.

The destruction of the reducing sugars or glucoses present by boiling with excess of quicklime was next tried. This process was entirely successful in so far as destroying the glucoses was concerned,

but it had no effect whatever upon the other carbohydrates, of an amorphous nature, present in the juices. Inasmuch as the glucoses exert the least unfavorable influence of the non-sugars present in the juices the process was at once seen to be inapplicable from a practical point of view. The experience of the Department, and of manufacturers of sugar, has shown that the reducing sugars known generally under the term of glucoses, exercise a much less influence in preventing the crystallization of the sugars than was formerly supposed. In fact, it is supposed that could all other disturbing influences be removed, the glucose might be unobjectionable in securing an almost complete crystallization of the sucrose present in the juices. It would furnish a mother liquor in which the crystallizable sugar would be highly insoluble and from which it would easily separate. Having abandoned, therefore, the methods of separation above noted, there remained to be studied some process which would separate as nearly as possible the gummy amorphous bodies from the juices without precipitating the sugar. The property of alcohol to produce precipitation in sorghum juice was made use of in the further study of this problem. On account, however, of the large amount of alcohol, which would be required to treat the juices in their natural state, or as they come from the diffusion battery, it was decided to apply the process at a later period of manufacture.

In order to carry out this idea the juices of sorghum were treated precisely in the manner in which they are ordinarily in a sugar factory. The natural acidity of the juices was carefully neutralized with lime and the temperature raised to the boiling point. The scums which were formed were carefully removed and the juice boiled in an open dish, until all greenish scums and coagulated matters were separated.

The inversion of sugar which takes place during the boiling, which lasts only a few minutes, was not noteworthy. The juices were next concentrated in vacuo until they reached a density of 45° to 50° Brix. After cooling, the sirup thus formed was mixed with an equal volume of 95 per cent alcohol, which was sufficient to produce a complete precipitation of the gummy amorphous matters. These matters were separated by passing through a filter press, forming a hard, firm cake, easily separated from the filter cloth. The filtered sirup was limpid and of an exceptionally pleasant flavor. Evaporating in vacuo after removal of the alcohol, it readily crystallized during evaporation, forming a massecuite of good grain and absolutely free from gum and capable of being treated most easily in a centrifugal.

From very poor sorghum juices from immature cane, having a purity of only 60, a most excellent article of massecuite and sugar was made by the above process.

In regard to the quantity of matters separated by alcohol, some determinations were made with the following results:

Percentage of gum secured by alcohol—	
Experiment 1.....	2.08
Experiment 2.....	1.88
Mean.....	1.98

The juices from which these separations were made contained about 16 per cent of solid matters; thus the percentage of matters secured by alcohol on the whole amount of solid matters present was 12.5.

It is seen from the above data that from each 100 pounds of sorghum juice about 2 pounds of gum can be separated.

The difficulties which have been encountered in manufacturing sugar from sorghum juices have been chiefly due to the presence of these gums. Their removal, therefore, if it can be accomplished on a manufacturing basis, would at once place sorghum in a high rank as a sugar-producing plant.

The alcohol which is used in precipitation can be almost wholly recovered by subsequent distillation. Our experiments show that the total loss need not exceed 5 or, at most 10 per cent, of the quantity of alcohol used. One of the most encouraging and at the same time least expected results of the work has been the demonstration of the fact that the gum separated in the manner above described is completely fermentable, yielding almost one half its weight in alcohol. It thus appears that from the gums themselves a sufficient amount of alcohol may possibly be derived to supply the whole waste of alcohol which would take place in the process of manufacture. Any additional quantities of alcohol which might be needed could be easily obtained from the molasses after the extraction of all the crystallizable sugar. In other words, the process which has been demonstrated as thoroughly practical in the laboratory, so far as can be foreseen for the operation of an actual trial on a manufacturing scale, is capable of being conducted with economy, and a proper stock of alcohol once being provided the wastage therein in the process of manufacture could be wholly, or in great part at least, supplied by the refuse matter which otherwise would be a manufacturing waste.

Experiments were also made to determine the quantity of alcohol necessary to precipitate the total gum matters and also the strength of the alcohol required with the following results:

SORGHUM SIRUP, OF 44° BRIX AT 60° F.

On adding 15 cubic centimeters of 80 per cent alcohol, to 25 cubic centimeters of juice, the main part of the amorphous matters was precipitated.

Series of experiments.

[Comparison showing quantities of alcohol of 70, 80, and 90 per cent and of methyl alcohol (crude; necessary to precipitate 25 cubic centimeters of sirup, of 44° Brix at 60° F.)]

	70 per cent.	80 per cent.	90 per cent.	Methyl alcohol.
Chief precipitation of amorphous bodies.	cc 20	cc 15	cc 10	cc 12
Total precipitation of those bodies	25	25	20	20

The portion of the amorphous bodies which is soluble in water becomes, in part, redissolved before filtration when precipitated with 70, and rather less so with 80 per cent alcohol.

The separation of the amorphous bodies can be attained on the manufacturing scale with 80 per cent alcohol by the application of 1 volume of alcohol to 1 volume of sirup of 44° Brix.

In order to illustrate the practical application of the method on a manufacturing scale in the manufacture of sorghum sugar the following theoretical data are given:

A normal sorghum juice may contain at 18° Brix 12 per cent of sugar; a normal sorghum sirup may contain at 44° Brix 29.33 per cent of sugar, which is equal to 29,330 pounds of sugar in 10,000 gallons of sirup. Of this, 29,330 pounds (from 7,280 to 13,000 pounds), or about an average of 10,000, has been obtained by the methods of manufacture in use.

By the use of alcohol for the removal of the amorphous bodies which prevent the crystallization of the sugar, the *minimum* per cent of sugar, which, after this process would be obtained, may be put at 80 per cent (87 per cent is usually computed from pure juices), or 23,464 pounds.

10,000 pounds, at 4 cents.....	\$400
23,464 pounds, at 4 cents.....	\$938
Cost of alcohol lost in the work.....	84
	<hr/> 854
Value of product, usual method.....	400
Value of product, alcohol method.....	854
	<hr/>
A gain of.....	454

In this estimate the material from which the alcohol is made is not regarded as of any value, since it otherwise would be wasted. If the molasses be used as a source of alcohol, then the item for the cost thereof must be increased.

On account of the ease with which a heavy sirup can be preserved it has also been thought possible that during the manufacturing season the whole apparatus of the factory could be directed to making sirup alone which could be preserved and worked into sugar subsequently.

Inasmuch as it is highly important, in working a sorghum crop, to have it taken off in as short a time as possible, any scheme which will tend to simplify the operation during the harvesting season is worthy of consideration.

It is true that the storage of a whole crop of sirup would require considerable room and the cost of tanks or cellars in which it is to be held would be an item which could not be neglected. However, it must not be forgotten that by the storage system the machinery of the factory could be operated during a much longer period. For instance, it is well known that the harvesting operations and the manufacture of sugar must be chiefly conducted during the months of September and October. The manufacture of sirup into sugar, however, could be continued through the winter months, or if they were found too cold, the work could be safely left until the beginning of spring, when the factory could be again set in operation.

The whole of the apparatus for manufacturing the alcohol and for treating the sirup therewith could, therefore, be built on a much smaller scale than if it were necessary to treat the sirup as soon as it was manufactured during the months of September and October. With the sirup already made and stored in cisterns a very small force would be sufficient to convert the whole of it into sugar and at a very small expense. It would thus be possible for one factory to take care of a much larger crop of cane than it could possibly do were the whole of the manufacturing operations to be conducted at once.

The sirup as made and as it passes into cisterns could be subjected to the influence of sulphurous acid or some other anti-ferment which would be sufficient to preserve it perfectly from fermentation, even

if there were danger of such a decomposition without any antiseptic treatment.

The storage capacity of a factory which would work 20,000 tons of sorghum cane will be seen from a perusal of the following data: Assuming of 20,000 tons of chips and 10 per cent marc we have, 11,782,030 pounds sirup at 55° Brix=volume of 149,988 cubic feet, requiring a cistern 20 by 86.5 by 86.5 feet. At 75° Brix=8,640,380 pounds=volume of 100,213 cubic feet, requiring a cistern 20 by 75 by 75 feet.

In the event of boiling from 55° to 75° Brix, the water evaporated will be, on 20,000 tons of cane chips, 3,141,650 pounds, or 377,150 gallons. Basing calculations on Yaryan's figures, the coal consumption (at 8½ pounds water per pound coal) in again evaporating from 55° to 75° Brix will be 369,600 pounds, using live steam altogether, as would be necessary in the contemplated division of the season. Hence the loss of coal occasioned by boiling to 75° Brix as a means of preserving and subsequent dilution would be $133.261 + 369,600 = 502,861 \div 2,240 = 225$ tons, plus incidental losses, radiation, time, etc.

Placing the value of coal at \$4 per ton, which is rather a high average, it is seen that the total additional expense, so far as fuel is concerned, involved in manufacturing the sugar after the harvesting of the crop, would be only about \$900 a year, a very insignificant item when compared with the value of the time gained.

In order that this method of production of sugar may become possible, it will be necessary for the revenue laws to be changed so as to allow the preparation of the alcohol used in the process to be carried on without tax. This could be easily done without any danger of defrauding the revenue. The alcohol could be made under bond, given by the sugar manufacturer, that it should be used only for the purpose of separating the gummy matters from the sorghum juice, and should in no case enter commerce for any purpose whatever. In making this alcohol the manufacturer should be allowed to erect such apparatus as may be necessary, and this apparatus could be under the direct inspection of revenue officers in order that they might be able to see that the conditions of the bond were faithfully carried out.

It is earnestly recommended that the revenue laws be so amended as to allow a trial of this process by the sorghum-sugar makers of the country. If this can not be done without a further illustration, the law, at least, should be so adjusted as to permit the Department to make an experiment on a small scale with this method in connection with the work which it is now doing in the experimental station for the improvement of sorghum cane and the manufacture of sugar therefrom.

It is important also that the Department be empowered, by a special grant, to carry out these experiments in a practical way. From the best estimates which are now at my disposal I should say that a grant of \$25,000 would be entirely sufficient to subject this process to an experimental trial. The magnitude of the interest involved is so great that it is hoped that no objection will be made to this experiment.

Not only is the increase in the output of sugar from sorghum cane to be taken into consideration, but also the improvement in the quality of the product. The sugar will be of a finer grade and much more easily separated from the molasses. The molasses instead of being, as it is now, a waste product scarcely marketable, and in many cases only

fit for cattle food, will be suitable for table use and especially for mixing, in case compound sirups are desired. The flavor of both the sugar and the molasses produced is of the finest quality and of such a nature as to render it difficult to believe that it could have been made from sorghum, which, under ordinary circumstances, affords a molasses which is totally unpalatable.

This process having been outlined above in such a way as to indicate its true character, it is hoped it may be given to the sugar manufacturers of the country without interference from any patents which may be attempted to secure its provisions for private benefit. As our patent laws now stand any process which has not been in use for two years may be covered by letters patent, but in this case it must be distinctly proved that the inventor is, as he claims in his application, the true discoverer of the process. This process having been discovered and operated by the Chemical Division of this Department, is unpatentable, except by the Department, for the common use of the people.

THE COMPOSITION OF THE BODIES PRECIPITATED BY ALCOHOL FROM SORGHUM SIRUPS.

The existence of starch and allied bodies in sorghum juices has long been a matter of demonstration. It was deemed desirable, however, in connection with the practical work of separating from sorghum juices the mucilaginous and dismorphous bodies present to inquire more particularly into their nature. As has already been indicated, the chief melassigenic or molasses-forming properties of the non-sugars present in sorghum juices must be attributed to the gums, mucilaginous bodies, and difficultly crystallizable carbohydrates present therein. The percentage of alkaline salts in the ash of the sorghum is so small compared with that of the ash in beets as to reduce the molasses-forming properties of the salts of the ash to the lowest possible degree. Quantitative determination of the amount of bodies precipitated by alcohol from the normal expressed juice of sorghum cane shows that about 2 per cent of the total weight of the juice of the cane belong to this class of bodies. The precipitation was made in juices in which a portion of the albuminous matter, together with the chlorophyll present, had been removed by coagulation with heat and careful skimming. This quantity of precipitate may therefore be regarded as that which would be retained in the sorghum juices during the process of manufacture, and finally appear in the mass-cuites and molasses.

An account of the details of the work which has been done on these bodies would be of interest only to professional chemists and it is therefore omitted. It was found that they were composed chiefly of mucilages and gums, together with certain nitrogenous bodies and difficultly crystallizable carbohydrates, related to the starch series, and including some starch.

A full description of this work will be found in Bulletin No. 29. The work outlined above was done in co-operation with Mr. Walter Maxwell.

CHEMICAL CONTROL OF SORGHUM SUGAR FACTORIES.

The Department made no direct experiments during the season of 1890 in the manufacture of sorghum sugar. The work done was confined solely to chemical supervision of the processes of manufac-

ture. To secure as wide an experience as possible in this direction chemists were detailed from the Department for the factories at Fort Scott, Topeka, Conway Springs, Attica, and Medicine Lodge, Kansas. A summary of the chemical work done, together with such data as were accessible, will be found following:

ATTICA.

Work at this station was started on the 19th of September and continued, at intervals, until October 25. On this latter date one of the lower doors of the diffusion battery cell was broken and it was not thought worth while to repair the battery for the remaining portion of the crop. A very small quantity of cane remained unworked. The many difficulties encountered in the working of this house would render it unjust to make the results a test of the possibilities of manufacture of sorghum sugar.

The cane crop was much shortened by a severe drought, which set in about a month after the planting and continued unbroken for sixty days. The yield of cane per acre was reduced from 12 to 15 tons of last year to 5 and even 3 tons per acre. Chinch-bugs were also quite numerous and did considerable damage. Hot winds, the most dreaded enemy of the farmer in that region, were prevalent during the continuation of the drought. Not only was the crop shortened by the continued dry weather, but also the supply of water for the factory was inadequate, the small stream upon which dependence was placed having been completely dried up. Under these conditions the factory was not operated continuously, but only during the day.

The necessity of better cultivation of the cane fields was fully manifested in a number of instances. The fields which received poor cultivation were almost devoid of crops, while those which received the best cultivation yielded a fair crop in spite of the hot and dry weather. It was not until October 12 that there were sufficient rains to insure an ample supply of water for operating the factory, but at that time it was not possible to get enough cane to operate the factory.

The seed which had been received from the Department of Agriculture produced, in all cases, the best cane grown in the locality, averaging 4 and 5 tons per acre above all other varieties. The loss of a large quantity of sugar in the battery was owing to the heaters which leaked very badly. Another serious loss occurred between the clarifiers and double effects. This was due to the inability of the double effects to evaporate the juice extracted so that some of the thin juice was left sometimes as long as 12 hours before being concentrated and, of course, fermentation took place.

Special attention was given to studying the characteristics of the cane showing that certain physical properties are associated with high percentages of sugar. By studying these properties carefully, it is possible for every farmer to go into his field and be able to determine certainly whether his cane is ripe or not. The most striking of these properties is found in the last joint of the cane bearing the seed head. By stripping the cane of its covering a yellow coloration will be observed extending more or less along the length of the joint as the cane nears maturity. By the extent of this coloration one is able to select the very best or the very poorest canes in the field almost as accurately as though tested by a polariscope. It is found that the cane which has the highest sucrose, lowest glucose and highest purity

has this coloration extending one-half the length of the joint. Should it be found to extend the full length, it shows that the cane has already commenced to deteriorate. On the other hand should no coloration be visible, it shows that the cane is not yet mature. These observations have extended over one season of rather remarkable characteristics and hence they may not prove equally applicable to a crop grown in a season with the ordinary amount of rainfall.

The analyses of the sorghum at Attica were commenced on the 9th of September and continued until the 24th of October. During this period one hundred and fifteen average samples, as taken from the field, were analyzed with the following mean results:

In the juice.

Per cent sucrose	14.26
Per cent reducing sugars or glucose	1.53
Purity coefficient	71.91
Maximum per cent sucrose	17.95
Minimum per cent sucrose	5.83
Maximum per cent reducing sugars or glucose	3.43
Minimum per cent reducing sugars or glucose .....	.55
Maximum purity of juice	90.89
Minimum purity of juice	25.83

Between the dates of October 6 and 9 the purities of the juices were remarkably high, averaging about 85, and the percentages of sucrose therein were almost 16, showing that at that season the cane was in the best condition for manufacture. The analyses, however, for the whole season show a cane well suited for the manufacture of sugar, and which should yield, if all the sugar could be obtained, except the quantity which would naturally stay in the molasses, quite 200 pounds to the ton of clean cane.

Many of the farmers found the growing of cane profitable, while in other cases quite a number failed to make any profit or cultivated the cane at a loss. The figures representing one farmer's account with the company will illustrate what may be secured in a poor season in the growing of sorghum cane.

Total weight of cane grown.....pounds..	357,785
Total weight of seed grown.....do....	74,915
Amount received for the cane.....	\$357.74
Amount received for the seed.....	\$35.18
Total receipts for the crop.....	\$392.92

Against this sum the following expenses are to be charged:

Cost of planting	\$87.50
Cost of cultivating.....	50.00
Cost of harvesting and delivering to mill.....	175.00
Total cost, as charged.....	262.50

Leaving a net profit of \$130.42. The number of acres cultivated in this crop was 30, and on the numbers given above the profit per acre would be \$4.35. It will be noticed in the above that no charge has been made for the rent of the land, which is, of course, a legitimate expense which must come out of the calculated profit per acre. The value of the land upon which this cane was grown is not known to me, but, judging from the average value of land in that locality, it may safely be put at \$20 to \$25 per acre; hence a deduction of \$2 per acre should be made for rent of land, leaving a profit per acre of only \$2.35 instead of \$4.35.

The analyses of the samples of chips taken from the shredders as they pass to enter the battery, which samples give a fair estimate of the quality of the chips entering the diffusers, show, as is usual in all cases, a less saccharine strength than average samples of field cane. The reason of this difference is twofold. In the first place the samples of the first chips must of necessity give a better representation of the crop than any possible selection of single stalks or number of stalks of cane can give. In the second place, in spite of the best clarifying apparatus, particles of the blades and sheaths enter the shredder with the pieces of cane, and the juices of these are expressed afterward and mingle with the juices of the cane. Forty samples of these chips were analyzed during the season with the following mean results:

In the juice.

Sucrose.....	per cent..	12.56
Glucose.....	do....	1.99
Purity.....		63.20

Thirty-two samples of the diffusion juices, representing the mean composition of the juices during the season, were subjected to analysis with the following mean results:

Sucrose.....	per cent..	7.99
Glucose.....	do....	1.20
Purity.....		66.48

Thirty-two samples of the exhausted chips, representing the mean composition of the whole mass of exhausted chips during the season, were analyzed, the analyses showing that they contained 0.60 per cent of sucrose.

Twenty analyses of the filtered and clarified juices, representing the mean composition of the clarified juices of the whole season, showed the following average constitution:

Sucrose.....	per cent..	8.11
Glucose.....	do....	1.01
Purity.....		67.46

Seventeen analyses of the sirups before entering the strike pan, representing the average composition of the whole sirup worked during the season, gave the following mean results:

Sucrose.....	per cent..	32.91
Glucose.....	do....	7.12
Purity.....		63.11

Eight analyses of the massecuites, representing the average composition of the whole mass produced during the season, gave the following mean results:

Sucrose.....	per cent..	54.89
Glucose.....	do....	12.33
Purity.....		62.35

Five analyses of the second massecuites, boiled from the first molasses after the separation of the first mass of crystals, showed the following mean composition:

Sucrose.....	per cent..	47.52
Glucose.....	do....	12.77
Purity.....		55.65

The total amount of field cane purchased during the season was 1,305.3 tons. After cleaning, the total weight of cane which entered the diffusion battery was 900.2 tons.

The theoretical percentage of sugar in the clean cane, as calculated from the juice of the chips, was 238.6 pounds.

The quantity of sugar obtained in a merchantable form can not be accurately known until the official report of the State Inspector is known. The quantity, however, in proportion to the total amount present was extremely small and probably did not exceed 75 or 80 pounds per ton.

The enormous losses, therefore, in manufacturing sorghum sugar which have always been noticed in practice are illustrated in a very emphatic manner by the results of the season's work at Attica. Such losses are due to the natural wastage during the process of manufacture, and are, of course, raised to an unusual degree where lack of skill exists in the manipulation of the factory. The chief losses, however, as heretofore, have been due to the character of the juice itself, presenting in its constitution peculiar difficulties in the separation of the crystallizable sugar present.

OPERATIONS OF THE TOPEKA FACTORY.

The Topeka Sugar Factory, which was destroyed by fire last year, was rebuilt during the present season and operated for the manufacture of sugar.

Difficulties of various kinds, but in no wise inherent to the process of manufacture, caused delays in the operations of the factory and rendered its work expensive. The supply of steam was not sufficient for the full working extent of the rest of the machinery, and the multiple effect pans were provided with very low domes, which rendered successful boiling difficult. Moreover, the fuel employed was of particularly bad quality. The pumping arrangements were found inadequate to provide an abundant supply of water.

The crop of cane was somewhat later in maturing than usual, due to the autumnal rains following a very dry summer. The crop ripened in a very irregular way, thus causing to be delivered to the factory canes in various stages of maturity. The amber cane reached its maximum maturity about the middle of September, and the orange cane about the middle of October.

The battery work was extremely irregular, the percentages of dilution ranging from 8 to 14, and the percentages of extraction of sugar from 80 to 95 per cent. The percentages of sucrose in the exhausted chips vary from 0.05 per cent to 2 per cent; the number of diffusion cells worked daily varied from twenty-three to one hundred and four, and the loss of time daily by stoppages was from two to fourteen hours. Under such irregular conditions of work, due generally to the causes already mentioned, it is not strange that attempts at the successful manufacture of sugar were fruitless.

Cane contracted for by the company was.....	acres..	1,200
Cane delivered to the mill was.....	do...	1,000
Cane delivered.....	tons..	6,412
Yield of cane per acre.....	do...	6.41
Total amount of sugar made.....	pounds..	278,687
Yield of sugar, per ton of field cane.....	do...	43.67

By the term "field cane" is meant the cane with its blades and tops. The average amount of clean chips afforded by such cane is 75 per cent. of the total weight. The amount of clean cane, therefore, entering the battery under this estimate was 4,809 tons. The yield of sugar, per ton of clean cane chips, was therefore nearly 58 pounds.

The sampling of the chips entering the battery was made in the usual way so as to secure a fair average of the cane worked. The analyses of these samples were commenced on the 10th of September and were continued until the close of the house on the 8th of November.

Forty-seven samples of fresh chips were analyzed with the following mean results:

In the juice.

Total solids	per cent..	15.97
Sucrose	do....	10.15
Glucose	do....	2.14
Purity		63.56

A mere glance at these figures will show that the cane was in a very poor condition for sugar making purposes. This was due to the causes already stated, namely, the autumnal rains which prevented the cane from properly maturing, and the fact that the fields were planted with mixed seeds so that some of the cane was mature at a much earlier period, and doubtless the principal cause was imperfect cultivation. The poor character of the chips for sugar making purposes is illustrated in a striking way by comparing the analyses of them with the analyses of chips from cane in other parts of the State. Considering the character of the material worked, the yield per ton must be considered as quite satisfactory.

Twenty-seven analyses of the exhausted chips were made, showing a mean percentage of sugar therein of 1.77. This result shows very poor battery work. A mean percentage of sugar in the exhausted chips of more than 0.5 per cent shows some grave defect in the method of working. This defect is usually due to imperfect chips; the shredders become dull, allowing large pieces of cane to go through unshredded, the internal portions of which are protected from the diffusion process. With chips properly prepared and the temperature of the battery properly regulated there is no difficulty whatever in securing extraction which will leave 0.5 per cent or less of sugar in the bagasse.

Fifty analyses of average samples of the diffusion juice were made with the following mean results:

Total solids	per cent..	12.99
Sucrose	do....	8.54
Glucose	do....	1.67
Purity		67.89

Forty-eight analyses of the clarified juices were made with the following mean results:

Total solids	per cent..	18.23
Sucrose	do....	8.91
Glucose	do....	1.57
Purity		68.49

Twenty-five analyses of the sirups entering the vacuum pan were made with the following mean results:

Total solids	per cent..	38.58
Sucrose	do....	25.24
Glucose	do....	3.94
Purity		64.69

For convenience of reference the work of the factory was divided into three periods, namely: First period from September 10 to 20; second period from September 20 to October 15; third period from

October 15 to October 30, not including the last two days of the run in November. The mean data for the three periods are as follows:

Fresh chip juice.

	First period.	Second period.	Third period.
Total solids.....per cent..	16.58	16.09	16.67
Sucrose.....do.....	10.92	10.39	11.18
Glucose.....do.....	2.68	1.81	1.84
Solids not sugar.....do.....	3.94	3.93	3.65
Glucose ratio.....	25.15	17.44	16.45
Purity coefficient.....	60.43	64.51	67.67

The means for the whole season, excluding the November run, are:

Total solids.....per cent..	16.33
Sucrose.....do.....	10.54
Glucose.....do.....	1.92
Solids not sugar.....do.....	3.86
Glucose ratio.....	18.23
Purity coefficient.....	64.56

The constant improvement of the material entering the battery from the beginning to the end of the season is strikingly illustrated by the above figures. We find the same fact true of sorghum that is illustrated in sugar cane, that the longer the season for manufacturing can be delayed the richer the material in sugar will become. With an average of 10.5 per cent sugar in the juice and 9.45 per cent sugar in the cane, the total amount of sucrose in a ton of clean chips is 189 pounds and the amount obtained in a merchantable form of the raw sugar, as indicated above, is 58 pounds, which would amount to about 55 pounds of pure sugar.

The results illustrate the striking loss of sucrose in the juice in sorghum sugar manufacture heretofore carried on, viz., a loss of 134 pounds of sucrose for each ton of clean chips worked. This loss, as has already been pointed out repeatedly, is due to the pernicious effects of the reducing sugars and organic matters not sugars present in the juice, such organic matters, as shown by our work during the present year, having amounted to 3.86 per cent. It is perfectly safe to say that the total loss of sugar in the molasses was almost exclusively due to the presence of these gummy matters in the juice. It is evident at once that the financial success of sorghum sugar manufacture must follow some method of work which would eliminate these sources of loss.

CONWAY SPRINGS.

The large factory at Conway Springs having been abandoned after two seasons of unsuccessful operation, the only work which was done at that place consisted in an attempt to make sugar in a small way by milling and open evaporation.

The results, easily predicted, only serve as another illustration of the futility of attempting sorghum sugar manufacture without any of the appliances or conditions necessary to success.

The promoters of the enterprise, however, desiring to have some chemical work done, a chemist was employed for the season. Chemical work was commenced on the 25th of September, and practically

concluded on the 25th of October. During this time the mill was in operation only at irregular intervals, and there was found a total lack of proper preparation. The whole process, in fact, was characterized by unscientific methods.

The cane showed a great deterioration from the quality produced in the preceding years, but the cause of this inferiority is not clearly evident.

Forty-two analyses of samples of cane from the field showed in the juice the following percentages :

Total solids.....	per cent..	18.1
Sucrose	do....	10.4
Glucose	do....	4.4
Purity	do....	57.5

Twenty-four samples of juices taken from the mill during the period it was in operation showed the following numbers :

Total solids.....	per cent..	16.5
Sucrose.....	do....	9.5
Glucose	do....	4.5
Purity.....	do....	57.6

The utter unfitness of these canes for sugar making purposes is at once evident. As a natural result of the poor quality of the raw material and inadequate methods of manufacture pursued, no sugar at all was produced, and even the molasses made was of a very inferior quality.

RESULTS AT FORT SCOTT.

The general operations of the Parkinson Sugar Company, and the results obtained, are set forth in the following report of the manager, Prof. J. C. Hart :

The spring of 1890 was all that could be desired by the sorghum growers. The winter had been mild, with just enough rain to make the ground work well, and the larger part of our cane ground was plowed before the first of March. The first planting was done March 28, and this cane did remarkably well, ripening the first week in August. The weather continued favorable until July, when it became very hot and no rain fell for several weeks. Cane was forced to head prematurely, especially on high ground and thin soil. In September there were heavy rains, and canes that had ripened early threw out from one to four new heads, which grew much taller than the original stalk and occasioned loss of sugar. The September rains brought on the late cane, so that the tonnage was good, though the quality was not what it would have been had the season been uniform. Work was begun in the sugar house August 19 and continued till November 1, a total of sixty-nine working days.

Acres of cane.....	1,100
Tons of cane.....	7,575
Tons for sugar	7,100
Pounds sugar.....	358,000
Gallons sirup and molasses	117,000

The chemist's report has not yet been made and I can not give the quality of the cane as compared with last season, though the density will average somewhat higher this year, and purity of diffusion juice about the same as last; that is, 62. Diffusion juice to September 15, from Amber, only shows a density of 11.35; September 15 to October 1, part Amber and part Orange, 13; and for October, all Orange, the density was 14.2. The amount drawn in October was 50 litres less than in September, but allowing for that the yield from Orange was better than from Amber. I received from the Department several selected seed heads which were grown at Sterling in 1889. I give the analyses of a few varieties as compared with last season:

Amber, 235; average seven analyses, 1889, sucrose, 18.51; Amber, 235; average twelve analyses, 1890, sucrose, 18.1; Brix, 17.3.

Maximum density August 16, 1890, 18.5; maximum purity August 16, 1890, 50.6; maximum sucrose August 25, 1890, 14.1.

Stalks small, but the variety is valuable for its high sucrose and early maturity. Seed heads of all tested stalks saved, together with several bunches not tested.

Cross of Amber and Link's Hybrid, 191; average nine analyses, 1889, sucrose, 15. Cross of Amber and Link's Hybrid, 161; average nine analyses, 1890, Brix, 17.7; sucrose, 12.8. First ripe cane, September 5; 17.7 Brix; 12.9 sucrose. Maximum sucrose, 12.9 October 7. A good variety, but rather slender and falls easily.

Cross of Amber and Orange, 233; average five analyses, sucrose 17.38. Cross of Amber and Orange, 233; average seventeen analyses, Brix 18.71; sucrose 14.21.

First test, September 5, Brix 18.6, sucrose 15, was ready for working ten days earlier and is valuable as an early cane, as it is stocky, stands up well, and holds its purity much better than Amber. On October 14 it showed Brix 21.44, sucrose 15.6, and October 24 Brix 18.9, sucrose 12.3.

India and Orange, 320; average ten analyses, 1889, 15.97 sucrose; average six analyses, October 1890, Brix 18.62, sucrose 14.43. This is a heavy cane and will be valuable.

Felger's Early, 265; 1889, Brix 19; no sucrose given. Twelve analyses, 1890; Brix 18.6, sucrose 13.78. First analysis, August 25; was ripe a week earlier and is very valuable as an early variety, being tall and strong.

Black African, Undendebule, 354, and Honduras gave good results, but need further trial to determine their value for this locality.

Beet seed was obtained from the Oxnard Beet Sugar Company and several plots were planted as soon as the seed arrived, which was May 20.

A very poor stand was obtained owing to heavy rains immediately following the planting. Web worms destroyed a large part of the crop. Twelve analyses in October gave Brix 16.05, sucrose 13. Beets taken from the field December 12 tested 17.76 Brix, 15.67 sucrose.

OPERATIONS AT MEDICINE LODGE.

Manufacturing operations at Medicine Lodge commenced on the 18th of August and continued until the end of October. The machinery in use last year had been thoroughly overhauled and placed in excellent working order. No delays, of any consequence, were experienced in working the apparatus, and, for the first time in the history of the manufacture of sorghum sugar, the losses due to delays were reduced to a minimum.

The crop of sorghum cane was grown in a season of great drought, which prevented the corn crop from maturing. The evil effects of the drought were felt also on the cane, but in spite of it a crop of considerable magnitude was produced. On the 25th of August the long period of drought and hot winds was broken by copious rains and from that time until the end of the manufacturing season frequent rains fell. The cane in the fields readily ripened after the rains and many fields which were considered worthless redeemed themselves and produced considerable quantities of merchantable cane. The high red loam of the uplands produced a better crop than the low bottom lands, both in quantity and quality. In addition to this, the first frost affected only the bottom lands and the cane on the uplands had fully three weeks longer season on this account than the cane on the lowlands.

Interesting observations were made on the effect of the drought upon the different varieties of cane. The Early Orange and Link's Hybrid gave about the same tonnage under similar conditions and also had about the same content of sugar. If there was any advantage it was in favor of the Link's Hybrid. The varieties Undendebule and Honey Dew gave disappointing results; the tonnage was light, sucrose and purity low, and the cane rapidly deteriorated after a light frost. A new variety of cane, which may be called, provisionally, Medicine Lodge Orange, made a splendid showing. The seed head

of this variety is small, compact, and does not spread or open on reaching maturity. The stalk is perfectly formed and resembles very nearly that of the Early Orange, from which it can be distinguished only by its earlier ripening. It contains a high percentage of sucrose, low glucose, and endures a dry season remarkably well. It ripens in from 90 to 100 days from the time of planting. It is also hardy and does not deteriorate rapidly after frosts.

The Black African was one of the best varieties tested during the season. This variety not only has high sucrose and purity, and low glucose, but is a large cane and endures drought well. Its tonnage was nearly double that of the other varieties and it maintained its high percentage of sucrose longer than any other variety tried.

As a result of the agricultural experience of the season, it seems best to plant only the early maturing varieties on the lowlands while the late maturing varieties should be planted on the uplands.

The results of the mean analyses of the cane chips entering the battery for the season show the following numbers:

In the juice.

Total solids.....	per cent..	18.29
Sucrose	do....	12.63
Glucose	do....	2.24
Purity.....		69.86

The exhausted chips contain 0.81 per cent sucrose; the mean polarization of the first sugars made was 91.8 and of the second sugars made 91.2. The mean percentage of sugar in the cane extracted for the whole season was 93.6. The mean percentage of marc or fiber in the cane was 12.2.

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DIFFICULTY OF MAKING SORGHUM SUGAR IN SMALL QUANTITIES.

It is to be regretted that certain hallucinations seem to constantly follow the development of the sorghum sugar industry. This Department has pointed out repeatedly the insurmountable difficulties attending the production of sorghum sugar in a small way and with crude apparatus and unscientific methods. The record of the past season at the various points where the Department was represented by its chemists tends to confirm the views in this regard so often expressed heretofore. Thus the development of this industry has had to contend not only with natural difficulties but with the discouragement attending numerous failures, although such failures were altogether due to causes which would have resulted as disastrously in connection with any other industry. In some cases, as in the experiment at Conway Springs for instance, the promoters testified to the honesty of their convictions by investing their own private funds without any public aid. While such an investment is certain to be followed by financial loss, what is far worse from a public point of view, it will prejudice the community against the whole business, and prevent people from viewing in the proper light processes which really give promise of success.

It is evidently the duty of the Department to caution farmers, and to reiterate what has been so often stated, that with our present knowledge, and with the present degree of development of the sorghum cane, it is an utter impossibility to produce sugar profitably in a small way and without an ample and suitable equipment. That a good article of table sirup can be made with moderate facilities, and profitably, has long been known, and I conceive it to be the duty

of the Department to encourage such work as that, and to discourage in every possible way attempts to make sugar under conditions and with apparatus suitable only for the manufacture of sirup. It is unfortunate that in spite of the unsatisfactory results a glowing report has been published of the season's work at Conway Springs, and still more unfortunate to find it published in an influential sugar journal without any comment whatever, thus lending to it an air of authority which it is feared may prove to some extent injurious.

If the alcohol method of treating sirups should prove to be a success, it might then be profitable in some localities to make a thick sirup in some small way for delivery to a central factory. Such a method might be advisable in cases where cane would otherwise have to be hauled a long distance to the central factory. The possibilities, however, are still in the future, and do not call for discussion at the present time.

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EXPERIMENTS WITH SUGAR BEETS.

From Mr. Henry T. Oxnard, the Department purchased 3 tons of sugar beet seed, of which the greater portion was the variety known as the Kleinwanzlebner, grown by Dippe Brothers, of Quedlingburg. In addition to this, however, smaller quantities of the White Improved Vilmorin were purchased, together with the varieties of beets grown by Lemaire and Florimond and Bulteau Desprez. These different varieties were put in 1 pound packages and sent to over one thousand different persons, mostly to those who had made special inquiry for them. Accompanying these packages were directions for preparing the soil and planting and cultivating the beets. Later directions were sent for harvesting and sampling the beets and for sending samples to the Department for analysis. Nearly one thousand different samples of beets were received by the Department, of which the analyses were made and the results communicated to the farmers sending them. In addition to this work a large number of the beet plots was personally inspected by agents of the Department, and particular inquiry was directed to a large number of farmers in regard to the methods of cultivation which they had pursued. Only in a few instances were the directions of the Department followed out to the letter. In most cases the planting and cultivation of the beet seed were conducted according to such methods as the agriculturist might hit upon at the time.

From the information gathered, it was found that the chief variation from the instructions was in the preparation of the soil. In very few cases was a subsoil plow used and most of the beets which were sent to the Department were evidently grown in soil of insufficient depth. In some cases where the exact directions for cultivation were carried out the character of the beets received showed by contrast with the others the absolute necessity of employing the best methods of agriculture for their production. It was not thought best the first year to make any effort to obtain from the farmers the exact yield of their beets per acre. The difficulty of securing such information is almost insurmountable. In the first place the amount of land under cultivation is usually guessed at and in very few cases are exact measurements made. The results, therefore, at best are only estimates unless the absolute control of measurements and weights can be secured. It was thought best, therefore, to depend for estimates of yield upon the actual quality of the beets produced, since it

is well known that about 40,000 beets of fair quality can be produced upon an acre. It is therefore fair to presume that the yield per acre would be, within ordinary limits, the weight of the average beet sent for analysis multiplied by 40,000. When, however, it is necessary to speak of beets weighing from 2 pounds upward the rule no longer holds good, as it would be evidently impracticable to grow 40,000 beets of such a size upon an acre. It is fair, however, to estimate the yield upon beets weighing about 1 pound at 40,000 per acre or 20 tons. It is not meant by this that a yield of 20 tons can be obtained by farmers at the beginning, for this is not the case; it is only exceptionally that such a yield can be secured. When, however, the exact methods of beet culture are thoroughly understood and the method of fertilizing and preparing the soil studied, it will not be difficult, with favorable climatic conditions, to secure a yield of beets equal to 20 tons per acre.

For the information of those who might desire hereafter to enter upon the cultivation of the beet, the following brief summary of the methods of preparation of the soil, fertilization and cultivation is given:

The soil which is to be planted in beets, if fertilized with stall manure, should have a dressing of well rotted manure applied in the autumn and plowed under. The plow should be placed at a depth of 8 or 9 inches and should be followed with a subsoiler, which should loosen the ground to the depth of 6 or 7 inches more, without throwing the subsoil on top. The layer of stall manure would thus be placed at a point about half way from the surface to the total depth to which the soil is loosened. If the stall manure be well rotted when applied the soil will be in excellent condition by spring for the reception of the beets. The farmer can not be too strongly cautioned against the application of the stall manure in the spring, nor against its application in the autumn unless in the well rotted condition mentioned above. There are many soils, in fact, in which the application of the stall manure is not at all necessary, namely, those soils which are rich in organic matter and those which have not been exhausted by long years of cultivation.

In regard to artificial fertilizers, the standards for the sugar beet, of course, are those containing phosphoric acid, potash, and nitrogen. The amount of nitrogen applied in artificial fertilizers, however, should be the minimum necessary for the production of a good vegetation. Any additional amount of nitrogen in excess of this quantity tends to produce a larger beet at the expense of its sugar content, and is to this extent injurious.

Phosphoric acid is usually employed in the form of superphosphates which are easily soluble by the growing crop.

Potash salts of organic origin have proved themselves to be the best; those which come from the beet-sugar factory itself being, of course, best suited for the nourishment of the succeeding crop. The potash and phosphoric acid in wood ashes also act with excellent effect. Inorganic potash salts produce a good effect when the soil is deficient therein. Of these inorganic salts kainite and high-grade sulphate are generally employed.

The artificial fertilizers may be applied in the spring if they are thoroughly plowed under by stirring the surface of the soil with an appropriate cultivator. The potash salts, however, should rather be applied in the autumn, inasmuch as it is important that they should be buried as deeply as possible in the soil.

For a full discussion of the principles of fertilization reference must be made to Bulletin No. 27 of the Chemical Division.

Planting.—The beet seed should be planted in rows about 18 inches apart. In very fertile soils the rows are sometimes placed only 16 inches apart. These rows should be made as straight as possible, and the beets are best planted in a small way by a hand drill and on a large scale by a horse drill. When a horse drill is used two or more rows can be planted at once. The rows when the contour of the soil permits are better made north and south than east and west, although this is a matter of no very great importance. It is highly important, however, that they should be perfectly straight, so that the beets will not be injured during cultivation. In some localities it is customary to keep the beet seeds in a moist and warm condition for about forty-eight hours before planting them; they are thus quite ready to germinate when placed in the soil. This is a perfectly safe process if, at the time the beets are planted, the soil is moist and warm enough to continue the germinating process, but if, on the other hand, the soil should be too cold or too dry, then this previous maceration of the seed might prove injurious to its vitality.

The surface of the soil in which the beets are planted should be, immediately previous to the planting, thoroughly stirred and loosened to the depth of 2 or 3 inches, and all clods should be broken and the surface left comparatively smooth. Much of the cultivation of the beets may be secured before their planting by having the soil in perfect tilth. The thorough plowing and harrowing of the surface just before planting destroys all the weeds which may have germinated, and thus leaves the beets a fair chance with the weeds in the race for life.

It is highly important that the beet seed should be planted very thick, much thicker, in fact, than would be required if they should all germinate. The policy, however, of planting the beet seed just where the beets are expected to grow, and in no greater quantities, would prove most disastrous, since at the best many of the seeds do not germinate, and thus there would be left long distances where no beets would grow. The very best growers of beets use about 15 pounds of seed per acre, although if the seeds were all good probably 3 or 4 pounds might be amply sufficient to obtain a good stand. The advice, therefore, is given to farmers to plant about 10 to 15 pounds per acre, since a little additional expense for seed will be more than compensated for in the uniform stand obtained. The beets should be covered to a uniform depth of about 1 inch. If they are planted much deeper than this it may be difficult for the tender plantlet to reach the surface; if at a less depth dry weather supervening may prevent their germination.

When the beets are fully above ground the spaces between the rows may be thoroughly stirred by the horse hoe, furnished with shields, described in Bulletin No. 27. These shields prevent the young plant from being covered, while the hoe thoroughly stirs the soil between the rows and kills all sprouting weeds. As soon as the beets begin to show three or four leaves the process of thinning should take place. This may be done altogether by the hand and hoe, or partly by a horse hoe. A very common method, when the stand is very thick, is to cross the rows with a slender horse hoe, which will take out about 6 inches of each row and leave about 4 inches untouched. The most healthy beet remaining in the 4-inch piece is left, while all the others are carefully taken out by the hand or hand

hoe. This will leave one beet for every 10 inches, which is quite thin enough. In fact, an effort should be made to have a beet every 9 inches in the row in rich soils, while in very poor soils the distance may be left at 10 to 12 inches. In very rich soils it may be brought down as low as 8 inches. This thinning process is the most laborious and expensive of all the processes in beet culture, but is absolutely necessary to secure a good crop.

The surface cultivation can be carried on almost exclusively by horse power, and the ground should be thoroughly stirred between the rows and to a considerable depth at least once a week until the foliage of the beet begins to cover pretty thoroughly the spaces between the rows. If the cultivation of the beet begins about the 20th of May it should continue at least until the 1st of July, and in some instances for a longer time. The more attention which is paid to cultivation the larger will be the yield, other things being equal.

It is highly important that beet growers should realize the immense amount of labor which is necessary to produce a good beet crop. Farmers who are accustomed to growing maize and wheat are apt to think that beets can be grown over large areas much the same way, while, in point of fact, it requires as much labor to grow 10 acres of beets as it would 100 acres of maize. Mistakes are thus often made by beginners in attempting to grow more beets than they can attend to, with resulting failure. All farmers not accustomed to grow beets should begin with small quantities, and when the art has once been learned they will be able to estimate the area which they can successfully cultivate.

STATUS OF THE MANUFACTURING INDUSTRY OF BEET SUGAR IN THE UNITED STATES.

The readers of the agricultural reports are well aware, from what has already been published, of the fact that a beet-sugar factory has been in operation in Alvarado, California, for more than ten years. This factory has proved quite successful and the culture and manufacture of the sugar beet is now an established industry in that locality. For three years another large factory has been in operation at Watsonville, California, and from reports, which are accessible to the Department, this has also proved to be successful. Last year a large sugar factory was built at Grand Island, and as far as manufacturing operations are concerned was completely successful. This factory contains the latest and best forms of machinery suitable to the production of beet sugar and was built and operated upon the most approved plans of sugar technical engineering.

The beets which were brought in for manufacture were uniformly of a high character, as will be seen from a discussion of the analytical data relating thereto further on. The data of manufacture, however, are not accessible to the Department, the factory being purely a private corporation and not feeling disposed to furnish the Department with an itemized account of expenditures and receipts. From the best information accessible to us, however, it appears that about 5,000 tons of beets were received for manufacture and that the amount of sugar made per ton of these beets was probably 240 pounds. If the company should apply for the bounty given by the State of Nebraska, which is 1 cent a pound, it would be possible to give the exact amount from the report of the bounty paid. The Department,

however, is not in possession of any facts in regard to this matter and hence only an estimate of the yield can be given.

By the courtesy of the managers of the company the Department was permitted to station a chemist at Grand Island, who had charge of the sampling of the beets as they came to the factory in wagons or carloads. Nearly three thousand analyses of samples were made and the full tabulated reports of these analyses will be found in a bulletin (No. 29) which will soon be issued on this subject, and a brief discussion of them will be found elsewhere in this report.

The proprietors of the factory were so encouraged by the season's work that they have decided to erect another large factory at Norfolk, Nebraska, and work on this factory is now going on.

Manufacturing experiments, on a small scale, with sugar beets, were also carried on during the season just past at Medicine Lodge, Kansas. About 80 acres of beets in all were harvested for the factory, and a summary of the work done will be given in another place and the details published in the bulletin above mentioned.

In general, the following remarks may be made concerning the last season's work in the beet-sugar industry, from a commercial point of view, in Nebraska and Kansas.

The summer in both localities was exceptionally dry. For this reason and on account of lack of knowledge among the farmers in regard to the proper methods of raising beets the average crop was very short. In Nebraska the exact tonnage can not be known, but probably it would not average more than 2 or 3 tons of beets per acre; in Kansas the average seems to have been somewhat higher. In many cases farmers obtained 10 and even 15 tons of beets per acre, showing that even in adverse conditions of season a reasonably large crop may be harvested when all other conditions necessary to the proper growth of the crop are attended to.

As might well be expected from the small yield, the farmers in general were dissatisfied with the season's work. It is not reasonable to expect satisfaction from a crop of so low an average when the labor of growing it is so great; but while the farmers are dissatisfied it must be confessed that a great deal of this dissatisfaction must be attributed to their own lack of knowledge of the subject or to their disinclination to put upon the beet fields the proper amount of labor and culture at the proper time. Instead of being therefore deterred from continuing the production of sugar beets, it would seem wiser on the part of the farmers to study carefully the methods of agriculture pursued by those who made a success of beet culture, and to imitate those methods during the coming season. The fact should not be forgotten, however, that even with the poor results obtained the beet crop was uniformly better than the average of other crops in the same locality.

It would be useless to hold out to the farmer the hope of financial reward from a beet crop which would average only 3 tons per acre; but if from this acre he could produce 10 to 15 tons of beets then his venture would prove financially successful. In order that the manufacture of beet sugar should become an established commercial success, the factories and the farmers must work in harmony. The method pursued in France and in Germany would probably be best suited to bring about this result. In those countries the beet growers themselves are usually shareholders in the factories, and thus participate in the profits. It is probable that the average dividend of German and French beet-sugar factories would not fall much

below 20 per cent net on the capital invested. The farmer, therefore, who has even a small interest in such a factory secures a handsome profit on his invested capital. At the same time he has a vote in the board of directors and is personally interested in the success of the factory. In many factories of Europe the stock is thus held by the beet-growers. If, on the other hand, the whole of the factory be owned by the capitalists, then there is a cause for continual conflict between the interests of the farmer and the interests of the manufacturer, although this conflict is perhaps more in theory than practice. Even if the factory be owned exclusively by the capitalists, it is to their interest to work in harmony with the farmers, in order that they may secure a crop of sufficient magnitude to render the operation of their factory profitable.

It perhaps, however, would be unavoidable at the beginning of the industry that a feeling of animosity should exist between the beet-grower and the manufacturer. After a few years the prices to be paid for beets, and other arrangements with the farmers will doubtless be adjusted on a scale of equity and satisfaction to all concerned. In case farmers have no money to put into beet-sugar factories they might take shares of stock and pay for them with beets during the first and second years; in this way they would secure a financial interest in the company, own their shares of stock, and pay for them from the proceeds of the field without investing in ready cash. By adopting some such plan as this it might be possible to get every beet-grower within reach of the factory to become interested as a stockholder.

ANALYTICAL DATA COLLECTED FROM VARIOUS LOCALITIES WHERE BEETS WERE GROWN FROM SEED FURNISHED BY THE DEPARTMENT.

The samples of beets which were sent to the Department in response to the request already noted were immediately analyzed and the results of the analyses communicated to the growers of the beets. These data have been tabulated by States and by counties in States, and will be printed in detail in Bulletin No. 29 of the Chemical Division. Returns were received from a great many States, but principally from Nebraska and Minnesota. A brief summary of the results obtained follows:

Two samples were sent from Missouri, from Bates County. These were of poor quality, containing only 8.4 per cent of sugar, with a purity of 66.8. The beets, however, were of good size, averaging 600 grams (100 grams are equivalent to 3.53 ounces). Two samples of beets were received from Texas, Scurry County. These beets were of better quality than those from Missouri, containing 10 per cent of sugar, with a purity of 69.3. They were, however, very much too large for first-class sugar beets, averaging 1072 grams in weight. One sample of beets was received from Idaho, from Ada County. This sample contained 8 per cent of sugar, with a purity of 68.3, while the beets were extremely small, averaging only 100 grams. Six samples were received from Massachusetts, five from Hampshire County, containing 11.2 per cent sugar, with a purity of 82.8, the average weight of the beets being 468 grams, and one from Suffolk County, containing 16 per cent of sugar, with a purity of 82.8, and weighing 350 grams. Four samples of beets were received from California, Los Angeles County. These contained an average of 14.7 per cent sugar, with a purity of 84.6 and a mean weight of 382 grams.

In order to secure brevity the data obtained for the other States and the localities where the beets were grown have been compiled in the following tables:

State and county.	No. of samples.	Per cent of sugar in the beet.	Purity coefficient.	Average weight in grams.	State and county.	No. of samples.	Per cent of sugar in the beet.	Purity coefficient.	Average weight in grams.
Connecticut:					Kansas—Continued.				
Litchfield.....	2	9.7	76.1	400	Clay.....	4	9.3	67.6	431
Maryland:					Douglas.....	2	6.4	63.1	1,175
Prince George's.....	81	12.3	79.7	416	Hamilton.....	2	12.1	76.4	336
Oregon:					Johnson.....	2	12.4	69.4	256
Jackson.....	2	15.1	73.4	560	Lyon.....	2	4.4	70.5	2,425
Washington:					Saline.....	2	7.4	61.2	460
Lewis.....	1	15.2	64.2	450	Stafford.....	1	11.5	73.2	249
Virginia:					Iowa:				
Augusta.....	10	11.4	76.3	415	Audubon.....	1	10.7	74.2	536
Loudoun.....	3	5.4	53.7	490	Black Hawk.....	1	12.5	79.5	372
Pennsylvania:					Carroll.....	6	12.8	78.2	121
Dauphin.....	2	8.4	76.7	1,205	Cherokee.....	2	10.4	65.2	674
Lancaster.....	2	7.5	72.8	565	Fayette.....	2	11.3	75.7	737
Philadelphia.....	1	10.04	73.2	1,225	Harrison.....	2	10.9	73.1	1,071
Wyoming:					Page.....	1	11.1	72.6	600
Carbon.....	2	12.3	79.6	1,213	Polk.....	2	8.0	55.0	225
Crook.....	1	16.3	75.0	460	Sioux.....	3	11.6	72.7	240
Laramie.....	3	17.3	84.8	508	Webster.....	4	14.4	74.8	260
Illinois:					Woodbury.....	2	9.7	67.0	225
Kendall.....	1	6.5	64.6	632	Michigan:				
Pike.....	1	10.9	71.8	1,303	Clinton.....	2	11.5	77.2	702
Platt.....	1	6.1	61.0	685	Eaton.....	2	9.1	70.0	700
Will.....	4	11.9	75.8	830	Gratiot.....	4	12.3	78.7	1,355
New York:					Huron.....	1	11.1	74.7	730
Genesee.....	5	12.2	79.4	1,722	Ingham.....	1	14.5	76.5	1,423
Oneida.....	2	11.1	78.8	423	Ionia.....	2	15.2	86.5	2,121
Warren.....	2	13.8	84.5	543	Lemawee.....	2	8.0	62.5	322
Yates.....	3	11.4	71.7	470	Macomb.....	2	15.4	82.4	266
Wisconsin:					Muskegon.....	11	12.3	80.0	773
Calumet.....	3	11.9	61.9	705	Saginaw.....	2	12.9	82.0	1,480
Keweenaw.....	2	13.5	79.8	522	St. Clair.....	1	10.0	71.5	1,480
Ozaukee.....	2	12.7	81.5	505	Indiana:				
Vernon.....	3	13.8	81.0	493	Benton.....	10	12.0	83.0	400
Ohio:					Cass.....	6	12.4	71.9	622
Butler.....	1	9.2	76.4	1,017	Clinton.....	1	18.1	78.6	430
Erie.....	1	8.8	71.5	806	Decatur.....	1	5.5	68.9	1,440
Hamilton.....	1	12.4	80.9	456	Grant.....	5	8.5	73.3	701
Randolph.....	3	12.3	76.9	625	Greene.....	2	13.4	77.2	264
Trumbull.....	7	9.6	77.9	806	Hamilton.....	2	10.2	62.7	565
Van Wert.....	2	6.2	67.3	370	Ramseck.....	2	5.5	61.6	714
Colorado:					Henry.....	1	10.0	62.6	280
Garfield.....	1	13.00	74.1	405	Howard.....	1	13.2	70.5	620
Larimer.....	7	14.00	83.2	644	Marion.....	6	9.4	65.6	520
Mesa.....	1	14.40	86.4	453	Montgomery.....	2	7.7	64.4	370
Phillips.....	3	12.60	71.9	635	Newton.....	2	10.0	71.7	540
Prowers.....	6	9.80	69.9	510	Pike.....	1	10.5	73.7	620
Pueblo.....	6	12.80	79.2	579	Tippecanoe.....	2	8.2	64.6	620
San Miguel.....	2	9.90	65.4	820	White.....	3	8.2	63.2	560
Yuma.....	2	9.90	69.5	373	Minnesota:				
South Dakota:					Ancker.....	10	12.6	76.7	630
Brookings.....	7	14.4	84.9	479	Becker.....	8	12.2	72.7	1,020
Brown.....	1	16.3	80.4	235	Blue Earth.....	2	10.5	74.1	1,040
Davison.....	2	12.8	72.3	406	Brown.....	2	8.5	69.1	1,134
Grant.....	1	11.0	73.0	858	Carter.....	4	11.0	71.1	620
Hyde.....	4	13.0	78.8	610	Chicago.....	5	12.9	79.9	760
Kingsbury.....	2	10.5	71.1	563	Clay.....	2	12.3	73.3	700
Meade.....	2	14.1	74.9	765	Costonwood.....	2	12.3	67.7	560
McCook.....	2	10.6	70.4	363	Dakota.....	2	14.6	81.1	260
North Dakota:					Parish.....	2	9.8	64.6	620
Burleigh.....	1	10.4	70.3	453	Phillmore.....	2	11.1	74.6	620
Cass.....	6	13.0	75.5	736	Goodhue.....	6	10.9	71.1	1,020
Hickey.....	2	11.0	70.4	1,000	Hennepin.....	6	12.4	77.9	1,235
Morton.....	1	13.9	79.9	546	Houston.....	1	11.0	80.0	1,040
Nelson.....	4	13.6	74.1	675	Isanti.....	3	10.0	70.9	1,020
Ransom.....	4	10.2	71.3	734	La Sauer.....	2	10.8	72.2	700
Sargent.....	2	30.8	77.6	570	Lincoln.....	2	12.3	78.0	1,240
Stutsman.....	7	12.5	76.7	701	Lyon.....	2	14.9	74.5	700
Traill.....	7	14.7	77.6	701	Marshall.....	1	8.5	69.5	700
Kansas:					Martin.....	1	17.2	12.5	1,040
Harber.....	3	14.7	80.0	363	McLeod.....	2	11.0	73.1	1,040
Hampton.....	3	9.3	73.3	1,406	Mucker.....	2	11.0	73.3	1,040
Butler.....	1	9.7	70.5	685	Murray.....	2	13.2	82.4	620

State and county.	No. of samples.	Per cent of sugar in the beet.	Purity coefficient.	Average weight in grams.	State and county.	No. of samples.	Per cent of sugar in the beet.	Purity coefficient.	Average weight in grams.
Minnesota—Continued.					Nebraska—Continued.				
Nicollet.....	1	13.0	75.6	612	Hall.....	2	16.1	88.8	423
Nobles.....	1	13.1	76.4	1,268	Hamilton.....	2	13.3	.....	235
Pipe Stone.....	1	11.0	71.0	1,154	Harlan.....	4	10.7	68.8	338
Ramsey.....	1	10.6	81.0	890	Hayes.....	3	14.2	74.5	913
Rock.....	1	13.5	79.3	870	Hitchcock.....	4	14.0	73.0	464
Steele.....	1	9.3	67.6	1,043	Holt.....	17	13.5	73.9	777
Traverse.....	1	17.0	75.3	708	Howard.....	1	11.9	79.6	810
Wabasha.....	1	9.8	71.0	380	Jefferson.....	7	11.8	72.4	454
Washington.....	1	10.3	76.4	1,108	Kearney.....	3	23.2	78.1	324
Wilkin.....	1	14.6	80.6	447	Kimball.....	5	10.8	70.4	227
Wright.....	1	10.0	71.4	910	Knox.....	5	10.7	71.4	868
Nebraska.					Lincoln.....	9	12.5	75.0	618
Antelope.....	29	12.5	74.7	419	Loup.....	2	9.6	66.0	602
Banner.....	3	11.4	70.4	612	Madison.....	5	11.6	74.7	533
Blaine.....	2	12.6	73.3	580	McPherson.....	2	12.4	76.2	238
Boone.....	25	10.1	69.2	550	Nuckolls.....	4	8.5	67.4	347
Box Butte.....	6	12.2	71.6	606	Pawnee.....	4	12.7	80.5	603
Brown.....	1	10.1	69.7	250	Perkins.....	7	12.4	74.9	257
Butler.....	9	12.7	68.9	245	Phelps.....	5	12.4	70.2	305
Chase.....	8	11.7	70.6	796	Pierce.....	1	10.9	75.2	565
Cherry.....	2	8.9	60.5	530	Platte.....	4	10.0	68.3	369
Colefax.....	7	11.8	71.3	661	Polk.....	3	10.9	68.4	533
Cumming.....	2	10.4	69.8	602	Red Willow.....	2	8.1	61.2	940
Custer.....	4	7.0	58.2	550	Richardson.....	5	9.8	65.4	733
Dawes.....	3	12.7	73.3	258	Rock.....	1	14.4	83.1	400
Dawson.....	2	10.5	73.3	670	Saline.....	2	7.8	60.1	425
Deuel.....	1	18.8	.....	248	Saunders.....	4	13.1	75.8	559
Dodge.....	2	14.8	82.3	600	Scott's Bluff.....	1	22.7	83.3	333
Dundy.....	1	10.0	67.7	1,565	Seward.....	2	11.2	72.3	450
Fillmore.....	5	11.6	68.7	677	Sheridan.....	9	11.2	69.8	503
Frontier.....	7	12.3	74.4	531	Thayer.....	13	14.6	77.8	632
Furnas.....	5	12.7	76.0	454	Valley.....	2	10.6	69.7	503
Gage.....	8	9.4	68.6	721	Wayne.....	2	9.0	70.8	413
Garfield.....	6	15.4	74.5	532	York.....	9	12.9	72.4	443

In the above summary of the beets sent from Nebraska are not included those which were examined at the Grand Island Sugar Factory under the direction of the Chemical Division, but only those which were sent directly to the Department at Washington for examination. In addition to these two sets of analyses large numbers of samples were examined in the laboratory of the Agricultural Experiment Stations at Lincoln and Madison, Wisconsin.

In a critical study of the summary given above there are many points of interest, a few of which only can be given here, while the others will be given at greater extent in Bulletin No. 29. In judging of the character of a beet for sugar-making purposes three factors must be taken into consideration. First of all, the beet must be large enough to make its growth profitable to the farmer. Experience has shown that a beet which weighs about 500 grams, that is, a little over 1 pound, is best suited to secure the interests of both the farmer and the manufacturer. Therefore, in all cases attempts should be made to grow beets as uniformly as possible of that weight. Having once established the average weight of the beet, the next point to be considered is its content in sugar. In the data given the percentage of sugar is reckoned on the weight of the beet itself and not upon the extracted juice. Sugar beets contain on an average about 5 per cent of marc and 95 per cent of juice. Therefore if the analysis is made upon extracted juice, the number obtained must be multiplied by 0.95 to give the percentage of sugar in the beet.

The question may arise as to how poor a beet can be in sugar and

still be profitable for sugar making. This of course is a question which has to be determined by a comparison with many economic problems, the study of which can not be introduced at the present time. In general, however, it may be said that the limit of profit in manufacture will be reached when the percentage of sugar in the beet drops to 12, although it is possible under certain conditions for factories to work economically and profitably on beets having a lower percentage of sugar than that indicated.

With the present degree of perfection in the production of rich sugar-beet seed, and with the knowledge of the scientific principles of agriculture which should guide the beet grower, it is possible, I think, to show that beets can be produced, under favorable soil and climatic conditions, which will contain on an average 14 per cent of sugar. The farmer, therefore, should not be satisfied if his results fall below this standard.

It will be easy to see by comparing the averages given in the above table how many of the beet growers have succeeded in growing plants which will average 500 grams in weight and contain 14 per cent of sugar.

In addition to these two factors, however, a third must be taken into consideration, namely, the purity of the juice. By the purity of the juice, or, as it is expressed in the table, the coefficient of purity, is meant the percentage of pure crystallizable sugar in the solid bodies present in the juice. For instance, if in 100 parts of solids there are 80 parts of pure crystallizable sugar, the coefficient of purity of that juice is said to be 80. The number 80 may be taken as a fair average which should be attained in this country. In the older beet-growing countries a much higher degree of purity can be obtained than this. The degree of purity of the juice is influenced chiefly by the amount of salts represented by the ash obtained on the ignition of the sample. In soils highly impregnated with mineral substances, such as are often found in our western States, the percentage of ash will be found very high, and there will be a corresponding depression of the purity coefficient. In lands, however, which have been long cultivated and scientifically treated from an agricultural point of view, the percentage of ash in the beet will be diminished and the purity coefficient correspondingly raised. The ash of the beet consists largely of phosphoric acid and potash, and these two substances are essential to the proper growth of the beet. It is therefore not expected that the ash of the beet shall be reduced below a certain content, otherwise the growth and maturity of the plant will be retarded. It will not be possible in the space which is at our disposal here to discuss each of the series of data obtained by these analyses, but the above remarks are made for the purpose of enabling anyone who is interested in any particular series or analysis to discuss it intelligently and determine from the numbers given the value of the beets produced for sugar-making purposes. At the present time, for the purpose of fixing a standard of comparison, I would say that the typical sugar beet for sugar-making purposes should weigh 500 grams, contain 14 per cent of sugar, and have a purity of at least 80. With such raw material at his disposal in sufficient quantity, the manufacturer can not fail of success, provided he be supplied with the latest and most improved forms of machinery.

It may also be of interest in connection with the data above given to discuss some of the particular qualities of the beet separately. In general the mistake is made by those not acquainted with the princi-

ples of the growth of the sugar beet and manufacture of beet sugar of judging of the possibilities of success by the percentage of sucrose in the beet alone. The danger of relying solely upon this constituent of the beet is at once manifest from the considerations above mentioned. Nevertheless as it is often done, I have collected into tabular form from the analyses given above all of the results showing from 15 to 18 per cent of sugar in the juice. In another table have been collected all the analyses in which more than 18 per cent of sugar was found. In the case of Minnesota 3 samples of beets were found in which the percentage of sugar was more than 18; in the State of Indiana, 1 sample; in Iowa, 1; in North Dakota, 4; in Maryland, 5; in Colorado, 1; in Wyoming, 1; in Nebraska, 13. Of beets showing a percentage of sugar from 15 to 18 in the juice, the following numbers of samples were found: In Illinois, 3; in Minnesota, 15; in Nebraska, 36; in Maryland, 8; in Iowa, 4; in Wyoming, 2; in Colorado, 9; in North Dakota, 4; in Massachusetts, 1; in Wisconsin, 2; in California, 2; in South Dakota, 6; in Michigan, 4; in Kansas, 3; in Washington, 1; in Oregon, 2; in Virginia, 2.

The production of beets containing from 15 to 18 per cent of sugar is not unusual, and such beets may be regarded as strictly normal in constitution, but possessing a particularly high content of sugar. When, however, the content of sugar in the beet exceeds 18 per cent it must be regarded at the present time as something abnormal and due to peculiar conditions affecting the particular locality, or even the particular plant itself. Such beets are usually extremely small in size, and the richness of their sugar content has been acquired at the expense of normal growth. In other cases the effect of a particularly dry season preceding the time of harvest or other very peculiar conditions may affect the sugar content. In many other cases, from the wilted condition in which the beets have been received, it must be admitted that a portion of the water which they contained has dried out between the time of harvest and the time of analysis, thus increasing the apparent percentage of sugar in the beet. It will doubtless be possible hereafter, when the beet has been more fully developed by careful selection, to produce beets normally which contain more than 18 per cent of sugar, but to expect at the present time the production of such beets on a large scale would be unreasonable, and such an expectation would not be realized. Even when we consider the other class, namely, those containing in their juice from 15 to 18 per cent, we must confess that it would be unwise to look for a production of beets on a large scale containing so large a percentage of sugar. In many of the cases of beets of this class the high-sugar content must be ascribed primarily to some of the conditions mentioned for the class above 18.

When, however, the tables are further studied and the remarkably low percentages of sugar are noticed which were sometimes found, it must be confessed that in these cases the abnormally low content of the sugar is also due to the abnormal growth of the beet. In some cases these beets are of great size, weighing 2,000 grams or over, and to this extraordinary growth must be attributed to a certain extent the low content of sugar. In general, it has been found that when beets exceed 500 grams in weight it is difficult to maintain their sugar content at a high standard. When, therefore, the beets become greatly overgrown it is always accompanied with a

falling off in content of sugar. In the cases, however, of the small beets, which have shown a low content of sugar, the result must have been due to defective conditions of soil and climate, or to defective methods of planting and cultivation, or to premature harvesting.

When we consider the varying qualities of beets which have been grown from the same seed, we are at once struck with the immense importance of the factor of soil and climate and cultivation in the production of the sugar beet. The fact that the seed of the Klein Wanzlebner variety of beet in the hands of different farmers will show a variation of from 6 to nearly 20 per cent of sugar, it must be confessed that we have in soil and climatic conditions, and in methods of cultivation, a more potent means of influencing the sugar content of the beet than is found in the germ of the seed itself. It can only be expected that a sugar-beet seed which is high bred will be able to reproduce its kind when it has become fully acclimated and has received in its new condition the same scientific treatment and selection which it had in its original home. The great hope, therefore, of uniform production of sugar beets high in sugar-producing power in the United States must be found in the establishment of culture stations, where different varieties of beets can become fully acclimated, and where they can receive the same careful scientific culture and selection which have brought them up to their present state of excellence in Europe.

CHARACTER OF BEETS DELIVERED TO THE GRAND ISLAND FACTORY.

Through the courtesy of Mr. H. T. Oxnard the Department was allowed to establish a laboratory at the sugar factory at Grand Island for the purpose of obtaining information in regard to the character of the beets entering into manufacture. In all about three thousand samples of beets were examined, a sample having been taken from every wagonload and every carload of beets delivered to the factory. These samples were taken in such a way as to give as nearly as possible the average character of all the beets worked. A large number of beets was taken from each sample, and after they had been properly cleaned and dried their average weight was taken. The beets were then rasped, the juice expressed, and an analysis made on the expressed juice. The total solid matter was determined by a specific-gravity spindle, and the percentage of sucrose in the juice was estimated by the polariscope. The purity coefficient was determined by dividing the percentage of sucrose in the juice as indicated by the polariscope by the percentage of total solids as indicated by the spindle.

Average weight of beets.—The average weight of all the beets examined was 209 grams. This small size of the beet was doubtless due to the extremely dry season. The drought throughout the region covered by the sugar-beet fields was the most severe perhaps that has ever been known in the State of Nebraska. Ordinary crops such as corn were almost total failures, and it is a matter of encouragement to note that in such a season the beets, although not making an average yield, yet did fairly well. On the whole, however, it must be confessed that the results from an agricultural point of view were disappointing; but this disappointment must be chiefly attributed to the exceptionally severe drought already mentioned.

It is also doubtless true that in the practice of the new system of agriculture which is required for the proper production of sugar beets many failures were made, and perhaps very few of the farmers practiced that form of agriculture which was best suited to the soil and the season. In a soil which is apt to be dry as in Nebraska too much attention can not be paid to the importance of loosening the ground to a good depth. Deep plowing followed by deep subsoiling, together with such harrowing and other treatment of the surface as will produce a perfect tilth, are absolutely essential to the production of a profitable crop.

The remarkably high percentage of sucrose shown in the juice is an evidence of the fact that the soil and climate of Nebraska are favorable to the production of a beet rich in crystallizable sugar. It must, however, not be forgotten that the extremely high percentage of sucrose in the juice is probably a reciprocal of the small size of the beet due to the dry season. Had the season been favorable to the production of a beet of average size, with a tonnage of from 15 to 20 per acre, the percentage of sucrose in the beets would doubtless have been less. This is well illustrated in the data obtained in the Department from the analysis of sugar beets sent from Nebraska. It is evident from the character of the samples which were received by the Department that the farmers have selected the larger beets to be sent on for analysis. It is seen by comparison of the respective sizes of the beets received for analysis by the Department with those received for manufacture at Grand Island that the beets sent on for analysis were about three times the size of those manufactured into sugar. It will also be noticed that in the beets received for analysis by the Department the percentage of sucrose is low as compared with those which entered into manufacture at Grand Island. It would therefore hardly be just to claim that beets as rich as those manufactured at Grand Island during the past season can be grown in quantities of from 15 to 20 tons per acre. It is not a matter of surprise that many of the farmers who grew beets are discouraged at the results of the first year's work. The planting and cultivation of the sugar beet as is well known are matters which require great labor and expense, and when, therefore, an unfavorable season cuts the crop very short, it is but natural that the farmer should be discontented. It is, however, difficult to see how he could have done better with any other crop, and the fact that in many instances even with the present dry season the farmers of Nebraska were able to grow 10 or even 15 tons per acre, shows that with proper cultivation and proper attention in other ways to the growing crop the evils which attend a severe drought can be greatly mitigated if not altogether avoided. It is not the purpose of the Department to encourage farmers to engage in an industry which does not give promise of success; but it will be a matter of regret to every one who desires to see the success of the sugar industry if the discontent which naturally attends a very unfavorable season should be sufficient to deter farmers from continuing the cultivation of a crop which under ordinary conditions promises so fair a yield as sugar beets. It would be wiser on the part of the farmers to continue the cultivation of the sugar beet until it has been demonstrated at least that even with favorable years it is not profitable. In that case it would be perfectly justifiable in the farmers, of course, to cease the cultivation of a crop which afforded no prospect of financial success.

EXPERIMENTS WITH SUGAR BEETS AT MEDICINE LODGE.

In addition to the analyses and control of the sorghum sugar work extensive examinations were made of the beets growing in the locality of Medicine Lodge.

The season was a peculiar one for beets. At the commencement of the rains, on the 28th of August, the beets were scarcely at all developed and were regarded as a total failure. After the rains commenced the beets grew rapidly and continued to grow vigorously through the months of September and October. About the middle of November the harvesting of the beets was commenced and continued until December. At that time the beets had reached a fair size and developed a high content of sugar. Two hundred and sixty-one wagonloads were brought to the factory and large samples were taken from each of these loads and subjected to analysis. The means of two hundred and sixty-one analyses follow:

In the juice.

Total solids.....	per cent.	18.52
Sucrose.....	do....	15.13
Purity.....		81.04

Four hundred and eleven miscellaneous analyses of the beets from different plots in the vicinity of Medicine Lodge were made with the following mean results:

In the juice.

Total solids.....	per cent.	17.80
Sucrose.....	do....	13.20
Purity.....		75.60

The fresh chips entering the battery had a mean sucrose content, in the juice, of 13.90 per cent, much less, as will be noted, than that represented by the analyses from the different loads.

The diffusion juices show a content of 10.45 per cent sucrose and a purity of 81.2.

The working of the beets with the sorghum-sugar machinery was extremely slow, and either from this cause or from the method of liming, which was very heavy without any subsequent use of carbonic acid, the clarification and boiling of the juices became a matter of great difficulty, and they suffered in this process rapid deterioration; for instance, the purity of the clarified juice was only 75.8 and of the sirup 78.3, while the mean purity of the massecuites showed the enormous depression represented by the difference between 78.8 and 59.4. The actual cause of this remarkable deterioration in boiling is not well understood, and the juices boiled with the greatest difficulty, it being almost impossible to prevent them from foaming in the pan. The semisirups also, after standing for a time, deposited a large quantity of mucus or viscous material, and this would lead to the supposition that a pernicious fermentation of a viscous or mannitic nature was the cause of the great loss of sugar during the boiling operations.

It is evident at once that the attempt to make beet sugar without appropriate apparatus must be regarded as futile. Beets of the quality of those delivered at the Medicine Lodge factory, if they had been properly and promptly manufactured, would have yielded almost 250 pounds of sugar to the ton; instead of this the yield was

extremely small, the separation from the massecuite very difficult, and the whole manufacturing process disappointing.

In regard to the probability of producing beets in the locality of Medicine Lodge, I am still of the opinion, expressed in Bulletin No. 27, that it is a locality too far south to expect the successful culture of the sugar beet. In using the term "too far south" it is not meant in an absolute sense, but too far south from the zone of the probable beet industry as indicated in the map given in Bulletin No. 27. The actual growing season at Medicine Lodge it will be noticed was not during the summer, but in the autumn after the rains fell and the weather had become cool. Had the early part of the season been wet enough to secure a growth of the beets it is hardly probable that they would have shown the high content of sugar which they did. The splendid results obtained at Medicine Lodge in the working of sorghum cane would seem to indicate the course which the sugar industry should follow in that locality. Everything indicates that the culture of sorghum sugar will prove a success while there is little to encourage the further development of the beet-sugar industry in that locality.

PRODUCTION OF SEED.*

There is, perhaps, no other agricultural crop which has illustrated in so marked a manner the importance of seed selection as the sugar beet. By the careful selection of those variations in the original beet which seemed most favorable to the production of sugar, and the careful selection of beets in the production of seed during the succeeding year, and by judicious and scientific fertilizing for the purpose of increasing the sugar content, there has been a great evolution in the sugar-producing power of the beet which has placed it at the head of the sugar-producing plants of the world.

The influence of the quality of the seed, according to Vilmorin, is absolutely predominant from the point of view of the results obtained in the culture of the sugar beet. The numerous experiments of scientific investigators have shown that remark to be true. In France the firm of Vilmorin-Andrieux & Co. has paid special attention to the improvement of the standard varieties of the sugar beet by the method above mentioned. They have endeavored to produce different varieties of beets of which each one would have all the possible advantages in the different economical and culture experiments to which manufacturers and farmers will submit them.

It is true, without doubt, that the same variety of beet could not be the most advantageous in every case, and that, according to the results to be obtained, it might be an advantage in one place to cultivate a variety extremely rich and in another place one, which, while still rich in sugar, would also produce a heavy yield in pounds. To these different needs different varieties of beets respond. In one case the pure white variety, in another the white variety with green neck or the rose variety with rose neck, or the Vilmorin Improved, a variety which is suitable everywhere and particularly in those countries where the duty on beet sugar is laid directly on the beet. Since the introduction of the new law in France, in 1884, levying the tax upon the actual weight of beet produced, the White Improved Vilmorin beet has recommended itself by its exceptional richness, its great purity, and the ease with which it can be preserved. But in order to meet all the conditions necessary to the greatest success

* Bulletin No. 27, Division of Chemistry, pp. 41-46.

it is essential to find out by experiment that variety of beet, which, in any given locality, fulfills most of the conditions required to produce a high yield of sugar with a minimum cost and one which will be equally profitable to the farmer and manufacturer.

At the present time, it is necessary in this country to go abroad for beet seed of the highest character. Up to the present time the sugar-beet seed which has been grown in this country has been produced without especial reference to the conditions necessary to maintain the beet at a high standard and to improve it as is done in foreign countries. In other words, the sugar-beet seed which one will obtain from American dealers, if it should be that which is grown at home, does not come with the pedigree of the beet, in regard to content of sugar and purity of juice, nor with that assurance of care in cultivation which the professional producers of beet seed in foreign countries bestow upon their work. There is no reason, however, to suppose that it is impracticable to produce beet seed in this country of as high a grade and of as pure a quality as that which can be obtained in other countries. The method of doing this will be briefly indicated.

In growing the beets the greatest care should be taken to secure all the conditions necessary to produce a beet of maximum richness in sugar, coupled with a yield per acre of fair proportions. This can be done by attending to the directions for culture to be given, combined with judicious application of those fertilizers which will tend to increase the sugar content of the beet without unduly increasing its size. The fertilizers which are most suitable for this purpose are carbonate of lime, when it is not present in sufficient quantities in the soil, a small quantity of magnesia, and larger quantities of phosphoric acid with varying proportions of potash and nitrogen, according to the character of the soil in which the beets are grown. No certain rule can be given for the application of fertilizers until the conditions of the season and the character of the soil in each particular locality have been carefully studied experimentally. For this reason, it is certain that in this country, as in others, the business of producing beet seed will be one entirely distinct from that of raising beets for manufacture or from the manufacturing thereof. It is this business which will require not only the highest scientific agriculture but the most careful agronomic skill.

SELECTION OF "MOTHERS."

The beets which are to be used for producing the seed should be selected on account of the possession of those properties which are most suitable to secure the highest results in the production of sugar. In the first place, all beets of irregular or unwieldy shape should be rejected; those selected should be of uniformly even texture, smooth outline, and symmetrical shape.

The sugar content of these beets should be determined by the analysis of others grown in the same plot and of the same seed, and thus obtain the average content of sugar for the whole lot. Only that class of beets showing the highest content of sugar combined with the qualities given above, and the greatest purity of juice, should be preserved. In many cases the beets themselves, which are to be used for propagation of seed, are subjected to analysis by the removal of a cylindrical section by an instrument provided for that purpose and the analysis of this section. In this way the actual sugar content of

the beet which produces the seed can be obtained. It is said that good results have also been secured by replacing the portion of the beet removed by sugar at the time of planting, which will afford an additional food product for the earlier growth of the beet in its second year.

Another method of selecting the beets, which has been widely employed, is that of determining their density. A solution of some substance is made in water, such as salt or sugar, of such density as to permit beets of inferior quality to float on the surface and those of superior quality to sink. These heavier beets, other things being equal, contain larger quantities of sugar and are more suitable for the production of seed. The beets, of course, which are to be used for the production of seed must be very carefully harvested so as not to be bruised, leaving the roots as much as possible uninjured, and they must be carefully preserved in silos over the winter until the time for transplanting in the spring. The transplanting and the successful cultivation of the beets need no detailed description.

The character of the beet is also sometimes determined by removing a small portion, as indicated above, for polarization, expressing the juice and determining its specific gravity by weighing in the juice a silver button of known weight.

The absolute necessity of securing a few beets of the highest sugar coefficient and purity for the purpose of producing a crop of seed in third, fourth, or fifth year, according to the number selected, has in the last few years been recognized to a degree unknown before. At first it was the custom to select the beets, by some of the methods mentioned above, in large numbers sufficient to grow in the second year seed for the market. A much more rational method, however, and one which secures higher results, consists in a more careful selection of the mother beets for the purpose, not of producing seed for the market in the second year, but only for the purpose of securing an additional crop of beets in the third year which in the fourth year will produce seed for the market. The methods employed by different seedsmen vary somewhat, but the principle in all cases is the same. The general method may be indicated by that pursued by Dippe in Quedlinburg:*

First year.—Seed planting for mother beets, from seed which came from the highest polarizing beets of different varieties, which have, of course, been kept separate. The planting is in rows 18 inches apart, and the plants are cut away in the rows so as to stand 10 or 12 inches apart. At the time of harvesting the beets are selected out according to form, growth, and leaf formation, as these best approximate the characteristics of the parent variety.

Second year.—In March and April these selected beets are examined in the laboratory † in the following manner:

At a certain point which it is presumed will give an average of the entire beet, a cylindrical piece is cut out, subjected to strong pressure in a juice press, which will give, for example, from 17 grams of beet 10 grams of juice, of which 5 cubic centimeters are diluted with lead acetate and water to 25 cubic centimeters, filtered and polarized. For the different varieties minimum limits are established, and the beets are arranged in three classes according to their polarization:

First, beets which go below the limit and are thrown out; second,

* Stammer, pp. 200, *et seq.*, Lehrbuch der Zucker Fabrication.

† This is not done until spring in order that only well-preserved beets may be chosen.

beets which are above the limit, and fairly good for seed purposes, and, third, beets which show an extra high figure.

These extra good beets are now examined still further, two more cylinders taken out, and the sugar estimated by the extraction method. From this result and the estimation of the sugar in the juice the (apparent) content of juice is calculated. Those beets which do not reach a standard, established for each variety (between 92 and 94), are thrown out, while those that attain it are the chosen "mother beets" of the crop, which are to perpetuate the variety, and which furnish the seed for each new succession, as mentioned in the first paragraph.

In the second year are planted all the beets saved, the extra and medium as well; the former furnish seed for extra mother beets, which are used as indicated for the normal-sized mother beets which furnish seed for a new succession, while the latter are to produce a generation of dwarfs, the seed from both being saved.

Third year.—The seed from the medium and extra mother beets is planted, and the latter produce the mother beets for future breeding purposes, as indicated, but the plants from the former seed, which was planted a little later than would be the case for beets ordinarily, and in soil fertilized with ammoniacal superphosphate and also some guano, in rows 12 inches apart, are cut out to about every 3 to 5 inches. The small beets are very carefully preserved under a thick covering of earth. In the spring of the

Fourth year.—They are uncovered and planted at about 26 to 24 inches apart. The seed from these when harvested in the fall is ready for the market, so that it has taken five years to attain this end.

In the establishment of Branne, in Biendorf, the procedure is similar, but the beets are selected by their specific gravity in the field. A woman sits at a table and cuts from each beet a very small piece and throws it into a solution of salt of known density (for example, with the Klein Wanzleben, 16° Brix). If the piece of beet floats, the corresponding beet is thrown away, but if it sinks the beet is reserved for further investigation in the laboratory. The beets chosen in this way are submitted to further selection by the examination of the juice from a cylinder.

In a somewhat different way, but still by means of the examination of individual beets, is the culture of the Klein Wanzleben variety carried on by Rabbethge, in Klein Wanzleben, whose object is not so much to furnish establishments with all the seed they require for planting, but rather with seed for the production of mother beets, and their own seed from these. The fact that Klein Wanzleben has never yet harvested more than 3 tons of seed in a season indicates the character of the work, which is much to be commended.

The seeds are always taken from mother beets of considerable weight, never from small or dwarf beets, and the aim is not so much to produce individual beets of exceptionally high sugar content, but large beets as well; that is, beets which give the highest yield of sugar from a given amount of land. These roots, which are chosen from a field of the best (Elite) beets, and which possess most distinctly the characteristics of the variety, are weighed and their juice polarized, and this operation is continued until 20,000 beets are chosen which fulfill the requirements as to weight and sugar content.

These 20,000 best mother beets are sufficient to furnish the planting

of a hectare ($2\frac{1}{2}$ acres), and from them are obtained 40 to 60 hundred weight of the best (Elite) seed, and this gives the following year 60 to 100 hectares of the best (Elite) beets, or 5,000,000 to 7,000,000 plants. From these are finally chosen the 1,500,000 seed-bearers which furnish the planting of 100 hectares and the seed for sale and for the perpetuation of the breed.

An entirely different method of selection is what is known as "family" breeding. Hundreds of specially selected beets, excellent in every way, are planted out separately. The seed of each is gathered and planted separately. If among the beets thus obtained any are found that excel the mother beet in every respect, and this improvement endures through several generations, these are incorporated with the other mother beets and used for breeding. As examples of weight and polarization of the selected beets the following figures for the highest and lowest weights are given, representing the best mother beets of the years 1883 and 1884:

Weight.	Sucrose in juice.	Weight.	Sucrose in juice.
<i>Grams.</i>	<i>Per cent.</i>	<i>Grams.</i>	<i>Per cent.</i>
1,350	11.24	600	15.11
1,450	13.63	600	16.28
1,250	14.29	600	16.32
1,500	15.57	400	16.13
1,450	14.60	550	15.62
1,700	11.76	400	16.83
1,850	14.86	550	16.88
2,100	14.35	400	16.63
1,900	14.60	600	15.63
600	16.13		

Among 200 beets were found only 11 with a weight of less than 500 grams; 12 with a weight of 500 to 600 grams; 29 with a weight of 600 to 700 grams; 21 with a weight of 700 to 800 grams; and finally 127, or 63 per cent, with a weight of over 800 and up to as high as 2,100 grams.

The beets between 700 and 1,000 grams are of nearly identical sugar content, a peculiarity of the Klein Wanzleben variety.

The established normal weight varies, according to the season, between 600 and 900 grams; in the year 1883 it was 897 grams, corresponding to the average of the beets from a field.

A still different method is followed by v. Proskowetz (Kwassiz). The beets from which selections are to be made are placed in a solution of salt showing 17.5° Brix, and those which float are used as fodder; those which sink are analyzed for sugar content by the alcohol extraction method, for which purpose a small quantity, half the normal weight, is cut out with a rasp and polarized in a 400-millimeter tube. Beets which give at least 19 per cent of sucrose form the first class; those showing 18 to 18.9, inclusive, the second, and those from 16 to 18 the third. Beets under 16 per cent are used for fodder.

METEOROLOGICAL CONDITIONS. *

In addition to suitable soil, fertilizing, and cultivation the sugar beet requires certain meteorological conditions for the highest production of sugar. Temperature and rainfall exercise the most

* Bulletin No. 27, Division of Chemistry, pp. 169-177.

pronounced influence, not only on the yield of beets but also on their saccharine qualities.

A mean summer temperature of 70° Fahr. for ninety days is sufficient to push the beet well on to maturity, while a much higher degree than this tends to diminish its saccharine strength.

The experience of beet growers in California indicates that in certain latitudes the beet can flourish with a much less rainfall than has hitherto been deemed a minimum for its proper growth; but this is not conclusive evidence that in all localities so small a supply of moisture would be sufficient. In regions of dry and hot winds, or where the subsoil is less porous, or aerial evaporation much more vigorous, less favorable results would be obtained. Dr. McMurtrie traced his area of beet-sugar limits with an isotherm of 70° Fahr. for the summer months, and a minimum rainfall of 2 inches per month for the same period. By the kindness of the Signal Office I have obtained a record of mean temperatures and precipitation for each month in the year for a period of ten years of those portions of the country in which the culture of the sugar beet is most likely to succeed. Also from the same source a tracing of the mean isotherm of 70° Fahr. for ten years for the three months of June, July, and August. Beginning at the city of New York this isotherm runs nearly due north to Albany, and then curves westward and slightly southwest, touching the edge of Lake Erie near Sandusky. It runs thence in a northwesterly direction to Lansing, Michigan, and thence southwest to Michigan City, Indiana. Thence it continues in a northwest direction through Madison, Wisconsin, to a point a few miles south of Eau Claire, whence it continues almost due west to South Dakota. Entering Dakota the line makes a sharp curve to the north, and near the one hundred and first meridian turns almost due south until it reaches the 33° of latitude in New Mexico, near the Mexican border. Its further tracing across the Rocky Mountains is not necessary here. Extending for 100 miles on either side of this line the map shows a belt extending from the Atlantic to the Pacific, within whose limits the most favorable conditions for growing beets, as far as temperature alone is concerned, will be found.

The mistake must not be made of supposing that all the region included within the boundaries of this zone is suitable for beet culture. Rivers, hills, and mountains occupy a large portion of it, and much of the rest would be excluded for various reasons. In the western portion perhaps all but a small part of it would be excluded by mountains and drought. Beginning at a point midway between the one hundredth and one hundred and first meridian, beets could be grown only in exceptional places without irrigation. On the Pacific coast only that portion of the zone lying near the ocean will be found suitable for beet culture.

On the other hand, there are many localities lying outside the indicated belt, both north and south, where doubtless the sugar beet will be found to thrive. The zone, therefore, must be taken to indicate only in a general way those localities at or near which we should expect success to attend the growth of sugar beets in the most favorable conditions other than temperature alone.

In respect of the rainfall it is necessary to call attention to the fact that a wet September and October are more likely to injure a crop of sugar beets than a moderately dry July or August. A wet autumn succeeding a dry summer is almost certain to materially in-

ture the saccharine qualities of the beet before it can be properly harvested. In this regard it will be seen from the tables of precipitation that the two Dakotas are more favorably situated than Oregon and Washington.

The rainfall in Oregon and Washington for September and October is 2.17, 3.25, and 2.24, and 4 inches, respectively, while in the two Dakotas it is only 1.11, 1.27, and 1.54 and 1.26 inches. The importance of this slight rainfall in securing a safe harvest without danger of second growth is easily recognized.

During the winter months the temperature that is best for beets is one of uniformity and sufficiently low to prevent sprouting or heating in the silo. Sudden and extreme variations are alike injurious—on the one hand causing danger from freezing and on the other from sprouting. On the coast of California the winters are so mild that the beets require very little protection, in fact more from the heat than the cold, while in Nebraska and the Dakotas the temperature often falls so low as to endanger the beets even in well-walled silos.

All these problems in meteorology deserve the most careful consideration from those proposing to engage in the sugar-beet industry, and it is hoped that the subjoined tables may help to elucidate them.

* * * * *

Dr. McMurtrie, in special report No. 28, has made a careful study of the climatic conditions in the United States favorable to the production of the sugar beet. Maps are given showing the southern limit of a mean temperature of 70° Fahr. for the three summer months, coupled with a minimum mean rainfall of 2 inches per month for the same period. The tables of temperature and rainfall from which these lines were computed are also given in detail. The observations made on the data collated are as follows:

"We see from this that the sections of the United States most favorable to beet-root culture are confined to the North, including New England, New York, a narrow band south of the lakes, Michigan, parts of Wisconsin, Minnesota, and Dakota. Here the line of the southern limit passes into the British possessions and enters the United States again in Washington Territory, and crossing western Oregon passes to the coast to the extreme north of California. In most of this band we find a favorable temperature, and the average rainfall is sufficient in quantity, but we are unable to make any observations concerning the number of rainy days. In California, as the tables will show, the temperature is sufficiently moderate, but, from examination of the figures for the stations for which the rainfall has been recorded, we find it to be remarkably deficient. Here, in order to make the culture a success, it would appear that the intervention of irrigation during the summer months would be an absolute necessity.

"We also note a few counties in the southwestern portion of Pennsylvania, and one county in Ohio, without the general band, where suitable meteorological conditions seem to exist. These counties are surrounded by the red line in the more detailed map that has been prepared, showing the county lines near to or over which the line of the limit of favorable meteorological conditions passes. This map is intended for more ready reference for those who may contemplate establishing the culture in the sections in the near neighborhood of the line.

"Now I do not mean to assert that the band of country I have thus plotted on the map is exclusively that in which the introduction of beet-root culture may be attempted with prospects of success, but it is certain that within this band the chances of success are greater than they are without it, and it also appears that all the unsuccessful attempts that have heretofore been made to establish the industry have been at points without it. It is therefore advisable that farmers or manufacturers who may design entering upon the prosecution of this industry should study with greatest care these influences which operate with so much benefit or injury upon the profit of the crop. It is evident from what precedes that the beet requires a cool or at least a moderate season for suitable progress in development, that it may not reach maturity in advance of the time for working it into sugar, and under the influence of the rains and elevated temperature of the autumn months enter into a second growth, thereby destroying the valuable constituents which render it so desirable as a sugar-producing crop.

"In this connection it has been suggested that in sections of protracted warm seasons, where the root will develop and attain full maturity in August and during the summer drought, the crop could be taken up before the appearance of the autumn rains, and by slicing and drying the roots preserve them until the arrival of the proper season. This mode of procedure has in fact been recommended to the agriculturists of the south of France, and has, it has been stated, been the subject of experiment in Algeria. The method has the objection of being a rather precarious one on account of the chances of the crop being caught after a long-continued drought by late heavy summer showers that would prove almost as injurious as the autumn rains.*

"After the directions given by Briem and others it is scarcely necessary to recapitulate here the meteorological conditions which appear to be required by this culture, yet the conclusions arrived at from our study of the subject, in addition, may not appear superfluous. The conditions, then, are in general, comparatively dry and warm spring months during the time for preparation of the soil, planting, and cultivating the crop; moderate temperature, abundant and frequent rains during the summer months, the time for ultimate development of the crop and its valuable constituents; cool, dry fall, the time for ripening, harvesting, and storing the crop. If these conditions prevail, the results will be good; otherwise they will be but medium or even bad."

The amount of rainfall necessary to the proper growth of sugar beets depends largely on the character of the soil, the mean temperature, and the degree of saturation with aqueous vapor of the prevailing winds. In the coast valleys of California, where the proximity of the sea preserves a low temperature through the summer, and where the porous soil permits the tap root of the beet to descend after moisture and moisture to ascend to the root, excellent beets are grown with little rain. The conditions would be entirely reversed in inland localities with high summer heats, stiff clayey soils, and arid winds.

In general, the amount of rainfall during the summer months in the Northern, Central, and Eastern United States is sufficient to secure a good growth, and therefore it may be said that proper soil and

* The experiment of drying beets for preservation in Maine, in the fall of 1878, proved quite disastrous financially for those who engaged in the enterprise.

attention being provided, beet culture might be undertaken in such localities with little fear of disaster from drought, save in a few exceptional seasons.

In fact, with thorough underdrainage and deep subsoil plowing, it would be possible to secure a good crop of beets in the regions indicated quite independently of the variation in the amount of rainfall.

The chief question, therefore, to be considered, is one of temperature and sunshine rather than of rainfall. In the present state of our knowledge it would not be safe to establish beet factories very far south of the mean isotherm of 70° Fahr. for the three summer months, without a more thorough study of the character of the beets produced than has heretofore been made. The possibility of finding localities south of this line, where sugar beets may be grown with profit, is not denied, but the necessity of further investigation is urgent. There are many places situated only a short distance south of this line where the soil, water supply, cheap fuel, and other local considerations supply peculiarly favorable conditions for beet culture, and in such places the industry would doubtless flourish, although the beet might not be quite as rich in sugar as when grown in a more northern locality. In all cases the length of the growing season should be sufficient for the complete maturity of the beet, and the freezing temperatures of winter should come sufficiently late to allow the beets to be safely harvested and covered.

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REPORT OF THE CHIEF OF THE DIVISION OF FORESTRY.

WOOD PULP INDUSTRY.

Various forestry interests have been canvassed by the agents who are assigned to this Division, as yet with incomplete results. The one to which I wish to direct special attention, as referring to the most important development in the use of forest products, relates to the manufacture of wood pulp.

It can be said, without fear of contradiction, that in no field of industrial activity has a more rapid development taken place within the last few years than in that of the use of wood for pulp manufacture. The importance of this comparatively new industry for the present, and still more for the future, can hardly be overestimated. Its expansion during the next few decades may bring revolutionary changes in our wood consumption, due to the new material, cellulose fiber or wood pulp.

Though rapid in its growth, the industry has by no means reached its full development. Not only is there room for improvements in the processes at present employed, but there are all the time new applications found for the material. While it was in the first place designed to be used in the manufacture of paper only, by various methods of indurating it its adaptation has become widespread; pails, water pipes, barrels, kitchen utensils, washtubs, bath tubs, washboards, doors, caskets, carriage bodies, floor coverings, furniture and building ornaments, and various other materials are made of it, and while the use of timber has been superseded in shipbuilding, the latest torpedo ram of the Austrian navy received a protective armor of cellulose, and our own new vessels are to be similarly provided.

* * * * *

ARTIFICIAL RAINFALL.

By an amendment in the Senate the appropriations for this Division were increased by the sum of \$2,000 and the words "for experiments in the production of rain" were added to the reading of work to be performed under the appropriations.

At first sight, the reference to this Division of such experiments would appear to have been made by reason of the claimed influence of forest areas upon the distribution of rainfall. It was, however, learned that these experiments were not intended to have such a connection nor were they to be devised for the purpose of finding out any special means for the production of rainfall, but they were to be carried on upon the assumption that explosions would have the desired effect and the money was appropriated to be expended in the purchase of explosives and in their discharge.

With such a programme the reference was, to be sure, unfortunate, for aside from the fact that neither the Division nor the Department in any of its branches commands the means or the men to conduct such explosions or the instruments which should at least be observed during the explosions in order to arrive at an understanding of the results, should any be attained, the amount appropriated in the absence of such means and persons is so totally out of proportion to the needs of the experiment, and, indeed, to the expected overawing result of controlling nature's most potent and hidden forces, that an attempt to use it in the proposed manner could hardly fail to be barren of results.

On the other hand, the War Department commands cannon, explosives, and men trained and accustomed to handle them, and in its Signal Service, instruments for meteorological observations and observers, and as long as the experiments are to be carried on upon the assumption that explosives will be effective, I have submitted the propriety of asking the coöperation of the War Department in this matter. I have also submitted, as my opinion, that the assumption for such experiments is, to say the least, hazardous, and that a much better use of the money could be made and valuable results much more likely attained, by devoting it to a series of experiments, which would bring us first nearer to a conception of what forces are at work in producing rain and to learning more about the chances of substituting feeble human efforts for grand cosmical causes.

The theories in regard to the causes of storms, and especially their local and temporal distribution, are still incomplete and unsatisfactory. It can by no means be claimed that we know all the causes, much less their precise action in precipitating moisture. It would, therefore, be presumptuous to deny any possible effects of explosions; but so far as we now understand the forces and methods of nature in precipitating rain, there seems to be no reasonable ground for the expectation that they will be effective. Hence, while I do not believe, contrary opinions of high authorities notwithstanding, that such experiments are necessarily devoid of merit, as long as they are conducted upon a careful, scientific plan and a large enough scale, it would be unreasonable and contrary to the spirit of our advanced civilization to rush into a trial which does not seem warranted by our present knowledge, instead of starting with a series of carefully devised experiments, the first object of which would be to learn something of the effects of explosions upon the atmosphere, a knowl-

edge which we do not possess and which, if not leading to the power of controlling rainfall, may considerably advance our knowledge of meteorological forces.

It sounds quite simple to try whether explosions will produce the precipitation, but when it comes to practically arranging the trial, such questions as the following it seems must be settled first: What kind of explosive shall be used? Is it intensity or frequency of explosions that should be tried? What amount should be used? What means of exploding are best adapted to the purpose and in what manner should they be employed; how high above ground would the explosions be effective? Lastly, how shall we know whether precipitation was due to the explosions? How far did other conditions influence precipitation, etc.? These are questions which it would puzzle experts to answer on any basis of present knowledge.

A large number of trials, with all sorts of differences in the conditions, might possibly settle some questions, but, unless careful observations, not easily devised, were made simultaneously as to the effects upon primary conditions, under which the result is obtained, our trials would lead us no further than we are at present, namely, to the very unsatisfactory assumption upon which we based our trials.

Under these circumstances, up to the present writing no attempt has been made to advance this problem.

Meanwhile I have tried to trace the history and scan the evidence which has led to the assumption that explosions will produce precipitation, and incidentally I have also inquired into other means of artificial production of rain which have been proposed.

It is no wonder, in view of the important office which the absence or presence of rainfall plays in the economy of man, that the desire to control it is as old as history, and various attempts to do so have been made or proposed in all parts of the world. The resort to prayer for the purpose is well known. In India the rainmaker, called *Gapogari*, is an important personage and similar professional rainmakers are found among African tribes and among the Indians. These, to be sure, have their secret methods, with which our knowledge of natural forces could hardly harmonize.

In more recent times two artificial causes of rainfall have exercised the minds of speculative meteorologists, fire and explosions.

It is a current belief that large fires and the cannonading during battles cause precipitation.

Singularly enough the belief that battles occasion rain is older than the invention of gunpowder. Thus we read in Plutarch: "It is a matter of current observation that extraordinary rains pretty generally fall after great battles;" and he explains it, that either some divine power in this way cleanses the polluted earth or that moist and heavy vapors steam forth from the blood and thicken the air, and make the moisture fall.

It should also be borne in mind by those who believe in the effectiveness of cannonades in bringing on storms, that according to Arago ("Thunderstorms," pages 164-165) during the latter part of last century, and as late as 1810, it was a popular practice in the communities of Southern France to fire off batteries, especially kept for the purpose, in order to *dispel* violent rain and hail storms, which were undesirable visitors of the region. Arago traced the history of this belief to a naval officer in that region, who had propagated the practice of navigators of that time of dispelling waterspouts and thunder

clouds by that means. Before this innovation the effect was sought by the ringing of church bells. Arago tried to disprove such an effect and to prove the opposite by showing that during the artillery practice at Vincennes, out of 662 days each preceding, following and during the practice, there were cloudy 128, 146 and 158 days respectively. This seems to be a rather small percentage to establish the positive effect he claimed; however, it may prove the futility of the opposite belief.

Napoleon has been credited with making use of the experience, that battles produce rain, in the disposal and manœuvring of his troops, and the belief in cannonade and rainfall as cause and effect has since become quite current.

The most elaborate effort to obtain evidence on this point is that of Mr. Edward Powers in his book, "War and the Weather, or the Artificial Production of Rain," published in 1871, when the extraordinarily wet seasons concomitant with the war movements in France brought the subject into prominence.

Although the writer himself, who took part in the campaign and well remembers the inclemency of the season, can not recall a single instance when engagements were followed by rain that would not have been anticipated from the general conditions of the atmosphere, yet he will not deny that the evidence collected by Mr. Powers from the Mexican war and that of the rebellion, with a few other additions, appears at first sight cumulative and overwhelming. In many cases, however, even the very imperfect records allow an explanation of the rainfall as due to natural conditions without effect of the cannonading, and it may well be asked whether as many, and even more, records could not be gathered of battles which were not followed by rain. Most of the evidence is drawn from recollections with which I find other recollections at variance, and since altogether general meteorological data for the period from which these records are drawn are lacking, the evidence after all falls considerably below the standard of positive proof. The negative proposition only is proved, that not all battles are unaccompanied by rain, as not all dreams fail of realization. In the accumulation of such evidence the danger is lest we indulge too readily in the "*post hoc ergo propter hoc*" argument. It would have to be shown that there were no well-understood natural reasons present for the occurrence of precipitation. In fact a few careful correspondents of Mr. Powers point out that such reasons often existed. The position taken by Maj. Gen. Thomas L. Wood, in his letter to the author, seems to be the proper one. He says:

Many battles have been followed by rain while others have not. This fact would seem to indicate that if the atmospheric disturbances caused by the firing in battle have any effect in producing rain, the actual accomplishment of rain depends, in a general manner, if not chiefly, on the condition of the atmosphere. The condition of the atmosphere should, hence, be one of the chief factors to be observed in the experiments you propose.

The only actual experiment that has come to the writer's notice in which a cannonade seems to have been directly effective was reported a short time ago in *La Nature* and is vouched for by a M. Guillaume. A French artillery division moved out for a sham battle; when ready for action a dense mist arose, which obscured the entire valley so that one could not see 300 feet. One of the officers, recalling the asserted influence of cannonades, proposed to try the remedy; four mortars fired 1-pound charges, first eight shots in suc-

cession, then two salvos of four each, when suddenly the mist disappeared, clearing the valley for 3 miles and a fine drizzling rain fell, which, as the cannonading of the sham battle continued, did not cease all day, sometimes falling in heavy showers. I have not been able to ascertain the authenticity of this report and the general weather conditions prevailing at the place and time.

Our present meteorological knowledge does not give much hope for success by this method of rain production. A method which appeared more reasonable, or at least one that seemed to be in agreement with our present theories of storm formation, was proposed by the author of these very theories.

The belief in fires and rain as cause and effect is also a very old one, but it was Espy who first, in 1839 (having shown that a column of air rising to a height where, owing to diminished pressure, it would expand, was by this expansion cooled, thereby condensing and eventually precipitating its vapor), proposed experiments "to see whether rain may be produced in time of drought, making a large body of air ascend in column by heating it."

Besides his general theories, which were accepted as most reasonable explanations of the formation of storms, he brought forward evidence to show that volcanic eruptions and large fires (he also refers to the cannonade of battles evidently as producing heat) were followed by rainfall.

The evidence is of the same kind as that brought to show the effect of cannonades. The negative cases, where conflagrations failed to produce rain would probably be found as numerous as the positive ones. In almost all those which allowed an analysis of atmospheric conditions, these were favorable to cloud formation, namely, a high dew-point and a calm and sultry air, which Espy admitted were needful conditions and which, at least the former, are rarely present in times of drought. The great fires of London and Chicago are cases in point. In forty-two large fires and two serious explosions, occurring in Australia, during twenty-one years, "there was not one instance in which rain has followed within forty-eight hours as an evident consequence of the fire."

It will again be interesting here to note that Volta, the great physicist, proposed to use fire for the very opposite effect, namely, to dispel thunder clouds.

The impracticability of this method was exposed by Mr. H. C. Russell, government astronomer at New South Wales, who showed that in order to increase by 60 per cent the rainfall at Sydney, where the average humidity is 73, and wind velocity 11 miles per hour, at least 9,000,000 tons of coal would have to be burnt daily, since it would be necessary to raise a column of air over a surface of at least 10 miles by 1,000 feet to a height of 1,800 feet; and while there may be found some flaws in his calculation, it gives an approximate idea of what forces are to be dealt with and of their enormity.

Mr. Russell, who was then (in 1884) antagonizing the idea of inducing the Australian Government to engage in experiments like those now proposed here, concludes:

It would seem unreasonable to hope for the economical production of rain under ordinary circumstances, and our only chance would be to take advantage of a time when the atmosphere is in the condition called unstable equilibrium or when a cold current overlies a warm one. If, under these conditions, we could set the warm current moving upwards and once flowing into the cold one, a considerable quantity of rain might fall; but this favorable condition seldom exists in nature.

Professor Henry, one of our most enlightened and unprejudiced physicists, expresses himself as follows in regard to Espy's propositions:

I have great respect for Mr. Espy's scientific character, notwithstanding his erration in a practical point of view as to the economical production of rain. The fact has been abundantly proved by observation that a large fire sometimes induces* an overturn in the unstable equilibrium of the atmosphere and gives rise to the beginning of violent storms.

To understand how precipitation may possibly be effected by artificial means, it is necessary to know how it occurs in nature. First we must have a source of moisture, and then conditions which will cause the condensation and precipitation of that moisture.

Besides the moisture carried into the atmosphere by its direct evaporation from the soil and minor water surfaces in the local neighborhood under consideration, there is an amount, and in most cases probably the largest amount, brought by currents from such large water surfaces as the seas. It may be taken for granted that the evaporation from the great oceans furnishes the largest amount of the water of the atmosphere.

To conceive the conditions under which the air is likely to give up this water held in suspension, it is necessary to know first that the air can hold suspended an amount of vapor proportioned only to its temperature. If the temperature be lowered by any means, the vapor will be condensed, while an increase of temperature permits a further increase of vapor. In order, then, to produce condensation it is necessary either to cool the air to or beyond the point (dew-point) where it can no longer hold the vapor, or to add to its moisture more than it can hold at its present temperature.

The next thing to know is that the air, being heated by contact with the earth, which receives its warmth from the sun, is warm near the ground and cooler farther away from its source of heat. Cold and warm air being lighter than cold it rises, being displaced by the cold air which sinks and takes its place to be warmed and to rise again, that there is a constant circulation of air currents established. At the same time by evaporation moisture is added to the air in contact with the surface of the ground, and vapor being lighter than air its upward movement is thereby assisted.

The third factor of importance is that air in ascending cools, not so much by moving into regions of less pressure (the column of air over it pressing it being less as it ascends) it expands, and in doing so it loses a certain amount of its heat latent, namely, the amount which is necessary to do the work of expanding, hence the sensible temperature of the air is reduced, and in consequence, as we have seen, its capacity to hold moisture, and hence it is brought nearer to condensation. The exact reverse is the case in descending air, namely, as it is compressed under the increasing amount of air above it, some of its latent heat becomes sensible heat; it becomes warmer and capable of holding more water, and hence is less liable to condense its vapor. The general rain conditions of any locality depend upon its position with reference to the air currents coming from sources of moisture, and especially the elevations intervening.

The cooling of the upper air strata and the condensation of the moisture which they carry, mainly derived from the great sources of water, the seas, is assumed to take place by ascending air currents.

* Should perhaps read, "is accompanied by."

The ultimate causes of these ascending currents are stated by Prof. Cleveland Abbe in Appendix 15 of the Annual Report of the Chief Signal Officer for 1889, in which he also discusses in detail all the forces now known to be at work in storm formation, as follows:

(a) Very local heating of, and evaporation into, the lower stratum and resulting steep vertical currents or interchange of air, due to differences of buoyancy produced by the heat and the moisture, and which differences continue to exist in the ascending mass, relative to its surroundings, until the heat is lost by radiation and the moisture by precipitation.

(b) Very widespread differences of temperature, such as that between arctic and equatorial regions, plateaus and lowlands, oceans and continents, the dark half and the illuminated half of the earth, these produce a nearly horizontal flow of air underrunning and uplifting the lighter air.

(c) The advent of the horizontal flow into a region where the coefficient of horizontal resistance on the earth's surface is increased, such as the flow from the smooth ocean to the land surface, or from horizontal smooth prairie to hilly country.

(d) The forcible pushing up over hills and plateaus and mountain ridges of air that would have moved horizontally toward a region of low pressure were the ground horizontal. Such cases occur systematically when a region of low pressure advances toward a mountain range.

(e) An updraft from the lower stratum is caused when the air immediately above it becomes abnormally buoyant, either by the sudden formation of cloud, rain, and evolution of heat, or by the warming effect of the sun on the cloud.

(f) An important irregular movement takes place when the air passes over hilly countries, due to the fact that the horizontal current impinging against the side of a hill is by its inertia driven upwards; it soon descends again and strikes other hills, and thus any given isobaric or isostatic surface has an undulation similar to the standing waves in a shallow stream flowing over a rocky bed. The interference of these uprising downflowing currents with the ground and with each other causes a loss of horizontal velocity, a thickening of the depth of the horizontal flow, a slight increase of static pressure.

(g) The local heatings and evaporation mentioned in paragraph (a) are most active during sunshine and sensibly zero at night time. These produce in the daytime uprising and conflicting currents and an increase of pressure.

With the fact before us that the ascending current is cooled and thereby condenses its vapor, we explain the aridity of the interior basins and the plains. The Pacific Ocean is the source of moisture, which is carried landward by the west winds. As these strike the coast range and again the mountain ranges of the Sierra Nevada they are forced to ascend, expand, and cool, and drop part of their moisture. Descending on the other side, they arrive not only much drier, but by compression much warmer. Not finding any additional source of moisture to enrich themselves from, except the scant evaporation from the ground, they pass over the interior basin and are made to ascend again the Rocky Mountain range, and that several thousand feet higher than before. Again they are drained and again they descend as warm and dry winds; hence the low relative humidity, deficient rainfall, and high evaporative power of the winds in the plains. Incidentally, I point out again here how under these circumstances the forest cover on the eastern slopes of these mountain ranges is of so much greater importance than on the western slopes, as it is likely to aid in recuperating to some extent the moisture conditions of the descending current, while with the removal of the protecting soil-cover its drying effects would be aggravated.

The amount of atmospheric moisture, then, in these regions which are, I suppose, to be mainly benefited by artificial rain production, for the reasons stated is exceedingly scanty, their mean relative humidity being below 45° during the months of vegetation. In order to bring air in such conditions to condense its vapor there must be

either a considerable addition of moisture or a very considerable amount of cooling effected, for which artificial means seem entirely inadequate.

There occur, however, times when the cloud formation would indicate that a considerable amount of moisture is suspended near the point of condensation, yet no precipitation takes place, probably on account of a stable equilibrium of air masses over large areas. It is at such times that there is more hope for influencing condensation and the timely or local discharge of the clouds.

But, if our present philosophy of the causes that produce condensation is correct, it can hardly be conceived how explosions can produce the ascending current necessary to effect the cooling of the upper strata. It must not be overlooked that the effect is to be produced through heights of more than 1,000 to 2,000 feet, and the disturbance of the stable equilibrium must encompass a considerable air column. While in such cases the possibility of results from mechanical disturbances like explosions may not be doubted, the use of these means for practical purposes remains extremely doubtful in consequence of the amount of explosive material which it would be necessary to use in order to produce results. Neither the disruption and violent agitation of the air, nor the thermal changes, nor the smoke produced by ordinary explosions would appear, either singly or combined, of sufficient magnitude to change conditions, as we have only lately learned during the explosion of the Dupont Powder Works, when 100 tons of powder exploded in eight seconds without producing an effect upon weather conditions.

We are then brought to the conclusion that unless other forces than these mechanical ones, and other movements than these mass movements, play a role in rain production and can be originated or set in motion by human device, we may as well abandon the attempt.

To the meteorologist, who, with the opportunity of watching the daily weather maps, the path and progress of the great storm centers eternally moving around the earth, probably often without disintegration, like the eternal motion of the earth itself, is brought face to face with the great cosmic causes of storm formation, who knows that an area of not less than 400,000 to 500,000 square miles must be under the influence of barometric depression to the amount of say half an inch before the storm discharges, the attempt to influence this grand natural phenomenon by the explosion of a few thousand pounds of powder or a fire of practicable dimensions appears indeed puerile.

Relying upon the working theories now accepted as explanatory of storm formation, he can calculate the omnipotent immensity of forces at work, against which limited human efforts seem utterly hopeless. This very year, almost as I am writing, Professor Hann, of Vienna, the highest living authority in meteorological science, has I believe definitely proved what has been long contended that our storms are only partial phases of the general circulation of the air, and even the variation in terrestrial surface conditions, the heating and cooling of continents and seas as well as the local influx of water vapor and its condensation are only of secondary importance, while we had hitherto considered them the causes of storms, barometric differences, etc. He admits that they may strengthen or destroy the ascending or descending eddies and modify their paths and their rate of progress, but insists that they can not act as primary causes. Other meteorologists, with questionable show of good phi-

losophy, ascribe the storm-producing air currents to magnetic forces of the earth, and the eddies and storms as a result of a readjustment of these forces.

And yet, while we may admit that the great storm movements are due to cosmic causes, we must not overlook that within their path there are minor terrestrial influences, sometimes not of entirely uncontrollable magnitude, which seem to influence within certain limits the localization of storms and the temporal distribution. We claim this influence for instance for forest areas, water surfaces, etc.

Altogether the theories for storm formation, while perhaps sufficient to explain the general philosophy, do not seem capable of explaining satisfactorily the smaller modifications and side shows, as we may call the exhibition of local showers, thunderstorms, and squalls. Nor can it be said that the detail of the manner in which the vapor condenses and the rain drop is formed, or in fact the forces active or conditions necessary in this condensation are fully known or understood. Who could, for instance, account for the fact that the dew-point may be at and above 100 without precipitation occurring? We know some seemingly necessary conditions, but we do not know all. For want of experimental knowledge meteorology seems to have lagged behind the times.

While the mass movements that are calculated to satisfy the existing theories of general storm formation may be necessary for such formation, is it altogether inconceivable or unphilosophical to think that other, molecular, forces may participate and in fact be a condition *sine qua non* in forming precipitation? Is it not also conceivable that, as in many chemical reactions, it is only necessary to give the impetus to molecular motion, to initiate the change, metabolism, which, being induced at some center of formation, spreads and assumes greater and greater proportions, similar processes may take place in the condensation of vapor from the air? If such were the case the expectation of at least a partial control by human agency might well be realized. Suggestions of this kind have been made before, not only by those who would suggest any forces to explain phenomena without understanding the possibilities of such forces to do the work, but by physicists upon experimental basis.

Laboratory experiments by Mr. Aiton seem to indicate the presence of dust particles as an essential condition for rain production; and, although Professor Abbe "dismisses from consideration at present" the influence of atmospheric electricity in storm production, he does so only because we know too little about it, and because an assumption of such influence does not seem to help the accepted theories of air movements as sole causes. Even so, he is compelled to admit that "actual measurements of electrical potential would seem to show that two masses of air in extreme conditions may attract or repel each other electrically to an extent sufficient to produce appreciable phenomena of motion even in comparison with the far more important motions produced by solar heat and terrestrial gravity."

That the air is generally negatively electric during rain storms was first established from over ten thousand observations by Herschel. Lord Rayleigh showed experimentally that moderately electrified water drops tend to coalesce, but that strongly electrified drops repel one another, from which we may infer a real causal connection between rain and electrical manifestations; and after all, even though the ascensional current may be the primary cause for cloud formation, electric conditions may determine the precipitation.

We have hitherto been told that the electrical discharges during thunderstorms are the sequel and not the cause of the condensation; but this is by no means proved. Nor is the following explanation of any assumed effect, given by Professor Abbe, the only possible one:

Even if we allow that the condensation of smaller cloud particles into large rain drops and their consequent fall to the ground depends upon the electrical discharge, yet this assumption if adopted will merely modify our mechanical views somewhat, as follows: The latent heat evolved in condensation must be considered as not wholly consumed in directly warming the air, but as partially employed in maintaining a state of electrical disturbance or tension, which latter comes to an end as soon as the flash or the silent discharge of electricity occurs. At this moment, therefore, on the one hand larger drops are formed and fall to the ground, and on the other hand the energy that had been potentially present in the electric phenomena now becomes heat and warms and expands the air. Thus the electric tension and its concluding flash have merely served to delay the communication to the air of the heat that was a few minutes before present in the vapor.

It was Sir William Thompson who first suggested that changes of weather might be foretold by the change from positive to negative electricity of the air or the reverse, and who devised the instruments for such observations in the electrometer and "water dropper." Unfortunately when, some few years ago, the U. S. Signal Service undertook some experiments in that line, under the direction of Prof. T. C. Mendenhall, this object of weather prediction was kept in the foreground, and the experiments, which form the basis of a voluminous report still unpublished, were only too soon abandoned because they did not yield readily results for the purpose in view. I am assured by the gentleman who was in charge of these investigations that, if carried on without this immediate object in view, they would undoubtedly have led to a better understanding of atmospheric conditions, and are worthy of further pursuit.

In conclusion I may refer to the observation that dust particles are found always charged with positive electricity, which may account for their office in rain production, and that experiments by Professor Trowbridge, of Harvard, on the effect of flames upon the electric conditions of the air would lend countenance to the belief in the effect of fires on rainfall, while the possible origination of electric currents as a result of friction in cannonades is suggested by Mr. Powers as an explanation of their assumed effect.

We may say, then, that at this stage of meteorological knowledge we are not justified in expecting any results from trials as proposed for the production of artificial rainfall, and that it were better to increase this knowledge first by simple laboratory investigations and experiments preliminary to experiments on a larger scale.

If explosions are to be tried at once then it would be necessary at least to take all possible precautions to ascertain the state of the atmosphere in all particulars before, during, and after the explosions, and to conduct and refer to the experiments rather as investigations into the effect of explosions upon the atmosphere than with the ultimate desired result in the foreground.

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REPORT OF THE STATISTICIAN.

SIR: I have the honor to submit my twenty-second annual report as Statistician of the Department of Agriculture.

The office is better equipped for efficient service than in any former year. The clerical force is ample, and its *morale* high. There has always been a difficulty in obtaining efficient expert service for special investigation and for coördination of foreign statistics, from inability to pay what such service commands in unofficial station. In this respect there has been some amelioration, and further improvement is expected. But this branch of the service is ever handicapped by the existing clerical classification, which tends to reduce the civil list to a dead level of mediocrity.

Official exchanges are more extensive than ever before. Statistical documents are received directly from the principal governments of Europe, Asia, Australasia, South America, and from Canada and Mexico. Their diversity in language, denominations of money, and in weights and measures, as well as in methods and subjects of investigation, complicate and increase the labor of compilation and collaboration.

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CEREAL CROPS OF THE YEAR IN DETAIL

As noted in the general review, the season was distinctly unfavorable to full production of any of the staple cereals. Seeding and planting took place under discouraging circumstances; the period of early growth was attended by adverse meteorological conditions, the latter season marked by alternations of flood and drought, and even the harvest interfered with by the lack of seasonable weather. All of these unfavorable conditions were, of course, not constantly present everywhere, but they were present throughout the whole crop year in one district or another of large production, and there is hardly a prominent grain State in which the yield per acre of corn, oats, or winter wheat is as large as the average of the past ten years.

It must not be presumed, however, that this partial crop failure will result in a stinted domestic food supply, or even prevent America from still being the granary from which the Old World may draw supplies with which to eke out her own deficiencies. With a crop of corn 30 per cent smaller than that of the previous year, making the smallest yield per acre with two exceptions noted in twenty years, we have a production per head of our population of 23 bushels, or 50 per cent more than the average production per capita of all cereals in Europe. Of wheat we have grown this year nearly twice the average per head of Europe, and our reserves, though somewhat depleted, with the small surplus which will remain over home requirements from this crop, will enable us to meet all probable foreign demands should ruling prices warrant a close clearing up of both visible and invisible stocks.

CORN.

The area of corn, which was slightly increased in planting, was reduced by failure and utter abandonment by more than 6,000,000 acres, the breadth harvested being estimated at 71,970,763 acres. In this breadth there is properly included all areas not absolutely abandoned, all fields, even though producing but a few bushels per acre,

and this fact, as well as that the estimated production is not in merchantable corn, but all corn—good, bad, soft, or nubbins—should be borne in mind in all comparisons with previous years, and in calculations of commercial supplies. The question of proportion of crop merchantable is always investigated later, after husking; partial feeding of the crop give ample opportunity for mature judgment. The greater portion of the 6,000,000 acres planted but abandoned was of course in Kansas and Nebraska, the result of the severe drought which afflicted large areas in each State, but there was unusually large area so lost in many other districts.

The estimated product is 1,489,970,000 bushels, or a yield of 24 bushels per acre. With the single exception of 1887, another year of severe drought, this is the smallest aggregate grown in any year since 1831. It is only 70 per cent of last year's great crop, but disparity in commercial corn between the two seasons is even greater. The seven States of Ohio, Indiana, Illinois, Iowa, Missouri, Kansas and Nebraska are the corn-surplus States, practically furnishing that enters commercial channels. The crop in the other States consumed where grown, and it exerts an influence on commercial corn only as it supplies home requirements or makes necessary demand on the surplus States. Outside of these seven States yield is practically only of local interest.

The returns of farm value of the crop show in a striking way the influence of short crops upon prices. While the crop aggregated only 70 per cent of that of last year, the aggregate money value of the crop to the producer is \$156,000,000 greater.

The advance in value is in greater ratio than the decline in volume. It proves that the law of supply and demand still controls, and that small crops are a sure cure for low prices, but unfortunately the absolute failure of the crop in large districts prevents all growers from sharing in the average enhancement of the remaining product.

The estimated acreage, product, and value of the crop, by States is thus presented:

States and Territories.	Acres.	Bushels.	Value.
Maine	97,855	1,008,000	\$7.40
New Hampshire	84,487	1,220,000	9.00
Vermont	54,893	1,830,000	13.50
Massachusetts	54,134	1,828,000	13.30
Rhode Island	12,907	402,000	2.90
Connecticut	50,407	2,014,000	14.60
New York	642,806	17,101,000	111.70
New Jersey	307,842	11,185,000	82.90
Pennsylvania	1,383,477	38,043,000	224.00
Delaware	223,186	4,128,000	29.00
Maryland	725,907	10,323,000	74.10
Virginia	2,109,853	20,922,000	150.50
North Carolina	2,726,599	26,254,000	191.60
South Carolina	1,570,230	16,078,000	117.20
Georgia	2,081,426	21,306,000	156.00
Florida	401,428	4,570,000	33.20
Alabama	2,489,226	25,380,000	186.00
Mississippi	1,951,051	24,326,000	177.00
Louisiana	1,061,109	16,379,000	119.00
Texas	4,116,281	62,802,000	459.00
Arkansas	2,002,375	23,443,000	173.00
Tennessee	3,600,057	37,602,000	280.00
West Virginia	671,733	13,420,000	98.00
Kentucky	2,816,155	33,645,000	251.00
Ohio	2,827,277	65,876,000	491.00
Michigan	977,789	26,580,000	197.00
Indiana	3,604,252	80,025,000	600.00
Illinois	7,154,424	187,446,000	1,400.00
Wisconsin	1,102,022	33,061,000	244.00
Minnesota	708,449	22,288,000	166.00

States and Territories.	Acres.	Bushels.	Value.
Iowa.....	8,771,290	232,439,000	95,300,164
Missouri.....	6,796,318	175,345,000	77,151,802
Kansas.....	3,542,891	55,369,000	28,187,241
Nebraska.....	3,072,800	53,310,000	26,548,992
California.....	159,871	4,396,000	2,857,094
Oregon.....	8,011	173,000	114,205
Colorado.....	42,133	767,000	483,097
The Dakotas.....	884,588	12,030,000	6,015,233
New Mexico.....	56,280	1,126,000	821,819
Utah.....	85,175	739,000	502,290
Total	71,970,763	1,489,970,000	754,433,451

For purpose of comparison a presentation, in condensed form, of the results for a long series of years is given. An examination of the table shows that with one exception the crop of 1890 is the smallest of the decade and with the same exception the most valuable per unit of quantity. The course of price follows closely the course of product, the highest price going with the smallest crop, in 1881, and the lowest price with the largest crop, in 1889. The decline in average yield between the period 1870-'79 and 1880-'89 can not be attributed to any decline in fertility or be considered as permanent. The first period included an unusually large number of fat years, years of plenty, in which nature smiled upon the efforts of the husbandman, while the latter number many that were lean, when droughts and floods robbed the worker of the fruits of his labor.

The statement is as follows:

Years.	Total production.	Total area of crop.	Total value of crop.	Average value per bushel.	Average yield per acre.	Average value per acre.
	<i>Bushels.</i>	<i>Acres.</i>		<i>Cents.</i>	<i>Bushels.</i>	
1880.....	1,717,434,543	62,317,842	\$679,714,499	30.6	27.6	\$10.91
1881.....	1,194,916,000	64,362,025	759,482,170	63.6	18.6	11.82
1882.....	1,647,025,100	65,659,545	783,867,175	48.5	24.8	11.94
1883.....	1,651,060,893	68,301,889	638,051,485	42.4	22.7	9.63
1884.....	1,795,528,000	69,683,780	640,735,590	35.7	25.8	9.19
1885.....	1,936,176,000	73,130,150	635,674,630	32.8	26.5	8.69
1886.....	1,665,441,000	75,694,308	610,311,000	36.6	22.0	8.06
1887.....	1,456,101,000	72,392,720	646,106,770	44.4	20.1	8.93
1888.....	1,987,790,000	75,673,763	677,561,580	34.1	26.3	8.95
1889.....	2,112,892,000	78,319,651	597,918,929	28.3	27.0	7.63
1890.....	1,489,970,000	71,970,763	754,433,451	50.6	20.7	10.48
Total	18,524,400,538	777,405,336	7,443,857,149			
Average, 11 years, 1880 to 1890.....	1,684,036,413	70,673,212	676,714,296	40.2	23.8	9.58
Average, 10 years, 1880 to 1889.....	1,708,443,054	70,543,457	668,042,370	39.3	24.1	9.48
Average, 10 years, 1870 to 1879.....	1,184,486,954	43,741,331	504,571,048	42.6	27.1	11.54

The great bulk of our corn crop is used at home, in fact is consumed upon the farms where grown, and but a very small proportion is ever shipped abroad. The shipments, however, small as they are, are extremely variable, depending entirely upon the domestic price. When the volume was greatest it amounted to but 6.5 per cent of the crop, and from that it ranges down to 1 per cent. The production and exportation, with the annual average of each for twenty years, is presented in the following statement, showing that during that period the foreign demand has amounted to only 3.9 per cent of our production.

Production and export of corn.

Years.	Production.	Exports.	Exportation.	Years.	Production.	Exports.	Exportation.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>P ct.</i>		<i>Bushels.</i>	<i>Bushels.</i>	<i>P ct.</i>
1876	1,069,321,939	19,472,523	1.8	1881	1,194,179,000	41,569,062	3.4
1877	991,809,040	20,747,000	2.1	1882	1,027,020,100	47,061,022	4.6
1878	1,036,719,000	20,114,074	1.9	1883	1,051,060,000	46,039,000	4.3
1879	992,074,000	20,960,034	2.1	1884	1,790,329,000	56,078,000	3.1
1880	950,128,000	20,000,000	2.1	1885	1,029,170,000	50,000,000	4.8
1881	1,117,000,000	50,000,000	4.5	1886	1,000,431,000	49,000,000	4.9
1882	1,000,000,000	70,000,000	7.0	1887	1,000,000,000	50,000,000	5.0
1883	1,000,000,000	60,000,000	6.0	1888	1,000,000,000	50,000,000	5.0
1884	1,790,329,000	56,078,000	3.1	1889	1,117,000,000	50,000,000	4.5
1885	1,029,170,000	50,000,000	4.8	1890	1,117,000,000	50,000,000	4.5
Annual average	1,054,000,000	46,700,000	4.4				

WHEAT.

The estimate of the wheat crop of 1890 was closely foreshadowed by the various returns of condition throughout the season. The October estimate of yield per acre is confirmed by later investigations, by returns of thrashing, and by the record of individual cultivators received and tabulated during December. The aggregate area harvested is estimated at 36,087,154 acres, against 38,129,888 acres in 1889 and 35,450,333 acres in 1879. This shows but little increase in the breadth harvested during the last ten years, though within that period the acreage ran up to nearly 40,000,000 acres in 1884 and fell away to 34,000,000 in 1885.

The total product is estimated at 399,262,000 measured bushels. The commercial demand that the crop be given in bushels by weight can not be acceded to. While in elevators, on railroads, and in commercial transactions the bushel means 60 pounds without regard to volume, yet farmers are accustomed to use and to think in the measured bushel. To require them to still further complicate their estimates of yield per acre by a mental calculation of quality to ascertain average weight would be unreasonable and the results misleading. The question of quality and weight is an after consideration, and is reported upon by this office in March of each year, when records of inspections are available, when millers and elevator men by actual tests of the scales can give authoritative answers. It is well known that no crop ever averages up to the standard of 60 pounds per bushel, the average for a series of years being probably between 57 and 58 pounds. Past records have shown that the annual variance in weight of the crop is not much more than a pound above or below this average, the extreme range in seven years being from 56.5 in 1888 to 58.5 in 1887.

The season was especially unfavorable in the winter-wheat States, those east of the Rocky Mountains suffering from damage wrought by March freezing when fields were bare of snow protection, and the Pacific coast from floods and overflows in the early spring. In no State in which the winter grain makes the bulk of the product is the rate of yield as high as the State average of the last ten years. The year was more favorable in the spring-wheat districts, the yield in the principal States, except the Dakotas, being quite as large as

the average. The division into spring and winter wheat is thus made :

	Acres.	Bushels.	Per acre.
Spring.....	12,507,060	143,988,000	11.4
Winter.....	28,520,104	255,874,000	10.9

The value of our wheat crop, unlike that of corn, which is regulated by the domestic demand alone, is dependent upon other factors than the volume of our own crop. Its price is affected by the supply of the world, drawn from all sources of production, and as a consequence we have had some large crops with high prices and small crops with lower values. The crop of the United States, however, is a prominent element in determining the world's surplus, and to that extent determines values. The farm value of the present crop has advanced to nearly 84 cents per bushel, and the aggregate value is \$334,773,678, only \$8,000,000 short of the value of the crop of 1889, although the crop is smaller by more than 90,000,000 bushels.

The estimates in detail, by States, are as follows:

States and Territories.	Acres.	Bushels.	Value.
Maine.....	40,313	543,000	\$624,307
New Hampshire.....	9,155	140,000	161,083
Vermont.....	19,478	335,000	371,874
Connecticut.....	1,878	30,000	33,018
New York.....	640,540	9,328,000	9,287,830
New Jersey.....	138,833	1,680,000	1,679,879
Pennsylvania.....	1,337,437	16,049,000	15,898,752
Delaware.....	94,790	919,000	892,684
Maryland.....	535,143	6,308,000	5,711,046
Virginia.....	801,956	5,614,000	5,399,144
North Carolina.....	717,328	3,150,000	3,155,803
South Carolina.....	178,609	790,000	787,660
Georgia.....	844,159	1,411,000	1,552,157
Alabama.....	353,049	1,319,000	1,437,406
Mississippi.....	60,730	286,000	314,073
Texas.....	510,711	3,575,000	3,326,228
Arkansas.....	321,848	1,575,000	1,543,619
Tennessee.....	1,175,032	7,873,000	7,636,663
West Virginia.....	302,086	2,320,000	2,209,759
Kentucky.....	943,518	9,152,000	8,419,035
Ohio.....	2,398,741	29,984,000	27,235,079
Michigan.....	1,701,561	30,271,000	18,943,967
Indiana.....	2,498,605	27,228,000	24,576,971
Illinois.....	1,853,173	18,161,000	15,800,163
Wisconsin.....	1,073,475	13,096,000	10,870,008
Minnesota.....	3,143,917	38,356,000	31,068,187
Iowa.....	1,685,080	19,041,000	15,234,123
Missouri.....	1,639,459	17,638,000	14,639,581
Kansas.....	2,058,000	38,195,000	21,709,842
Nebraska.....	1,418,069	15,315,000	11,609,424
California.....	2,426,730	29,121,000	23,131,778
Oregon.....	887,350	12,895,000	9,648,844
Nevada.....	18,489	250,000	314,654
Colorado.....	96,030	1,777,000	1,439,010
Arizona.....	25,980	311,000	290,044
The Dakotas.....	4,207,432	40,411,000	28,287,719
Idaho.....	88,056	1,370,000	1,038,931
Montana.....	67,550	1,498,000	1,190,680
New Mexico.....	90,610	1,105,000	1,050,170
Utah.....	130,251	2,279,000	1,777,927
Washington.....	439,275	6,071,000	6,134,027
Total.....	36,087,154	399,302,000	334,773,678

An examination of the results of each harvest since 1880 shows that in but two years has the average yield been lower than that of the present crop, in 1881 and in 1885, the only years in which the de-

iciency in an aggregate volume was greater. At the same time the average value of the crop has been greater in five years of the eleven, showing that price is influenced in a large measure by the crops of other lands. The average yield per acre has been very uniform during each of the ten-year periods since 1870, the difference being less than one-third of a bushel.

Years.	Total production.	Total area of crop.	Total value of crop.	Average value per bushel.	Average yield per acre.	Average value of acre.
	<i>Bushels.</i>	<i>Acres.</i>		<i>Cents.</i>	<i>Bushels.</i>	
1880	428,143,828	37,980,717	\$474,321,870	95.1	11.3	\$12.6
1881	382,280,021	37,776,023	436,960,437	113.2	10.2	11.3
1882	504,185,478	37,067,194	441,623,122	89.2	13.6	11.9
1883	421,066,161	37,423,597	343,643,272	81.1	11.3	10.5
1884	512,763,000	36,375,885	520,962,390	104.5	13.9	12.0
1885	357,112,630	34,186,261	373,231,261	77.1	10.4	9.4
1886	437,178,631	36,866,184	374,236,731	82.5	12.4	10.4
1887	456,305,610	37,641,793	398,612,660	86.1	12.1	10.2
1888	411,808,000	37,096,138	345,248,050	82.6	11.1	10.2
1889	436,560,000	38,123,406	342,691,707	82.8	11.2	9.8
1890	526,202,000	36,087,154	534,773,073	101.8	14.3	12.6
Total, 11 years, 1880 to 1890	4,696,215,398	408,878,773	4,652,869,719			
Average, 11 years, 1880 to 1890	445,110,536	37,170,796	432,142,011	82.5	12.0	10.4
Average, 10 years, 1880 to 1889	449,065,320	37,379,162	371,930,304	82.7	12.1	9.8
Average, 10 years, 1870 to 1879	312,150,726	23,187,414	227,407,658	73.4	12.4	12.6

OATS.

There is a decrease from the acreage of 1889 of slightly more than a million acres in the area of oats harvested, but the great falling off in the volume of the crop is the result of the deficient yield per acre. The year was especially unfavorable for this crop from the beginning, and the final yield is the logical sequence of the returns of condition throughout the growing season. The steady enlargement in the volume of this crop has been one of the features of our agriculture during the past decade, and, like corn, the demand has been for domestic consumption. Its use for human food is steadily increasing, though the aggregate thus used is small. Like corn it is used as feed for animals, and there is an intimate relation between the two grains growing out of their interchangeable use. The value of the crop depends partially upon the size of the corn crop, and the present crop, short itself, and coming with a small corn yield, commands a high price. The farm price is the highest in ten years, except in 1881, another year of short corn yield.

The yield per acre averages but 19.8 bushels, the lowest ever returned by this office, while the average for a series of years would not be far from 27 bushels.

As in the case of corn, the short crop of the present year is worth more in the aggregate to producers than the crop of 1889, which was the largest ever grown. With a decline in volume of more than 225,000,000 bushels there is an absolute increase in value of \$50,000,000. There is a lesson of wisdom in these figures, a remedy for low prices.

The estimates in detail are as follows:

States and Territories.	Acres.	Bushels.	Value.
Maine.....	100,607	2,847,000	\$1,622,891
New Hampshire.....	81,359	862,000	482,929
Vermont.....	106,591	2,798,000	1,396,342
Massachusetts.....	23,275	598,000	328,992
Rhode Island.....	6,545	158,000	82,703
Connecticut.....	39,019	790,000	418,601
New York.....	1,343,418	28,913,000	11,956,430
New Jersey.....	141,537	3,440,000	1,224,295
Pennsylvania.....	1,277,424	21,072,000	10,546,413
Delaware.....	22,931	298,000	154,146
Maryland.....	113,075	1,357,000	597,036
Virginia.....	672,178	6,587,000	2,964,305
North Carolina.....	673,672	6,198,000	3,160,889
South Carolina.....	333,225	4,108,000	2,500,918
Georgia.....	562,387	5,455,000	3,273,092
Florida.....	53,540	573,000	349,456
Alabama.....	405,344	4,864,000	3,015,759
Mississippi.....	361,992	4,778,000	2,806,976
Louisiana.....	42,982	567,000	345,849
Texas.....	689,274	11,059,000	6,082,692
Arkansas.....	193,831	3,967,000	2,102,361
Tennessee.....	682,759	6,486,000	2,918,735
West Virginia.....	142,107	1,506,000	677,850
Kentucky.....	465,152	3,954,000	1,779,206
Ohio.....	1,111,332	30,004,000	8,401,670
Michigan.....	941,088	25,035,000	11,074,494
Indiana.....	1,017,122	17,800,000	7,297,860
Illinois.....	3,372,451	70,821,000	29,036,803
Wisconsin.....	1,405,888	38,919,000	15,567,635
Minnesota.....	1,500,084	38,408,000	14,308,736
Iowa.....	2,767,359	71,397,000	27,180,093
Missouri.....	1,412,571	34,579,000	9,585,707
Kansas.....	1,302,894	31,269,000	11,822,302
Nebraska.....	1,053,069	22,430,000	8,747,761
California.....	70,655	1,945,000	1,058,087
Oregon.....	321,940	6,658,000	3,329,100
Colorado.....	100,725	2,498,000	1,248,990
The Dakotas.....	1,188,157	24,846,000	7,950,815
Idaho.....	36,440	1,038,000	654,056
Montana.....	90,225	2,797,000	1,650,398
New Mexico.....	16,350	392,000	223,394
Utah.....	38,491	1,059,000	582,177
Washington.....	104,393	5,497,000	1,643,652
Total.....	29,431,369	529,621,000	222,048,486

The bushel value of the present crop has been exceeded but once during the past decade, in 1881. In that year the yield was only slightly below the average for ten years, and the crop was one of generous proportions. The price was high because of the short corn crop, admirably illustrating the relations between the two grains. The rapid enlargement of the area devoted to oats is shown by the fact that the average breadth between 1880 and 1890 is more than double that between 1870 and 1880. A slight diminution in the rate of yield, however, has prevented the average product from doubling during the same period.

Years.]	Total production.	Total area of crop.	Total value of crop.	Average value per bushel.	Average yield per acre.	Average value per acre.
	<i>Bushels.</i>	<i>Acres.</i>		<i>Cents.</i>	<i>Bushels.</i>	
1880.....	417,885,380	16,187,977	\$150,243,565	36.0	25.8	\$9.26
1881.....	415,461,000	16,831,600	193,198,670	46.4	24.7	11.48
1882.....	498,250,610	18,494,691	182,978,022	57.5	26.4	8.89
1883.....	571,302,400	20,324,962	187,040,264	32.7	28.1	9.20
1884.....	588,628,000	21,300,917	161,528,470	27.7	27.4	7.58
1885.....	629,409,000	22,783,030	179,631,860	28.5	27.6	7.88
1886.....	624,194,000	23,658,474	186,137,930	29.8	26.4	7.87
1887.....	650,618,000	25,920,906	200,699,790	30.4	25.4	7.74
1888.....	701,735,000	26,908,282	192,424,240	27.8	26.0	7.24
1889.....	751,515,000	27,462,316	171,781,006	22.9	27.4	6.25
1890.....	623,621,000	26,431,369	222,048,486	42.4	19.8	8.40
Total.....	6,367,579,390	246,326,124	2,030,712,605			
Average, 11 years, 1880 to 1890.....	578,870,654	22,393,557	184,610,237	31.9	25.8	8.24
Average, 10 years, 1880 to 1889.....	584,395,839	21,906,376	180,860,412	30.9	26.6	8.22
Average, 10 years, 1870 to 1879.....	314,441,178	11,076,822	111,075,225	35.3	28.4	10.03

FARM ANIMALS.

The annual estimates of increase or decrease in farm animals made in January, and are published in the January-February report which has not been prepared, the annual going to press much earlier than usual. These estimates will be found in that report, which will be issued in February. The winter of 1890-'91 was unusually severe in the range regions, especially in Northern latitudes and on the Pacific coast, though the season east of the Missouri was one of extraordinary mildness. The losses in Washington and Oregon were very heavy, according to information apparently reliable, in some districts taking half to three fourths of all the cattle. The April report made the loss about two million cattle, and it is probable that full depreciation was not revealed, especially as to the Pacific slope. A considerable reduction in numbers of cattle is probable. The fall as nearly as they can be approximated, will be indicated in detail in the first report of the Statistician in 1891, the issue for January-February.

DISTRIBUTION OF DOMESTIC ANIMALS.

The increase in the commercial movement of farm animals during the past twenty years is one of the most striking facts in the commerce of agricultural products. It suggests a large increase in production and an advance in the rate of domestic consumption.

CATTLE.

The receipts of cattle at Chicago, Kansas City, St. Louis, and Omaha are more than three times as large as fifteen years ago, and have increased more than 70 per cent in five years. The increase exceeds 2,300,000, while the increase in exportation is only about 250,000 or including increase of meat exportation about 1,000,000 head leaving nearly three fourths of the increase for home consumption. The total exports of 1889-'90, in beefs and beef, were little short of 1,000,000 animals, much above the average of our beefs in exportation.

Receipts and shipments of Western markets.

Years.	Chicago.		St. Louis.		Kansas City.		Omaha.	
	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.
1875	532,964	301,709	201,422	129,748	91,000	No record.	.....	.....
1876	920,843	666,534	335,742	215,701	174,794	126,972	.....	.....
1880	1,382,477	896,614	424,720	326,879	244,709	194,421	.....	.....
1885	1,805,518	744,056	386,320	225,249	506,027	412,891	114,165	25
1890	1,962,900	704,675	377,520	212,958	490,371	370,350	144,457	73
1887	2,352,008	791,483	464,828	377,419	668,224	453,575	286,723	131
1888	2,611,543	968,265	546,875	336,208	1,056,086	682,622	340,459	204
1889	3,034,291	1,250,971	608,190	397,879	1,220,343	744,510	467,340	222
1890	3,484,290	1,200,909	639,014	361,225	1,472,329	923,552	506,099	236

Comparing receipts and shipments, we find a decrease in the proportion of shipments, due to the great development of the dressed meat trade, which increases the proportion slaughtered in the West. The use of the refrigerator car has wrought a great change in the methods of transportation of meat, both to the Atlantic seaboard

and to Europe. The rapid increase of the entire movement is a suggestive fact in the history of our agriculture. The aggregates of these primary markets are as follows:

Years.	Receipts.	Shipments.	Years.	Receipts.	Shipments.
1870	755,886	521,437	1897	3,751,788	1,703,693
1875	1,431,339	1,089,497	1898	4,554,978	2,193,277
1880	2,051,906	1,909,914	1899	5,219,154	2,530,281
1885	2,912,688	1,482,966	1900	6,202,222	2,828,966
1890	4,976,878	1,961,108			

Receipts of Eastern cities.

Years.	New York.	Boston.	Philadel- phia.	Baltimore.	Total.
1870	361,076	194,592	196,738	80,021	701,427
1875	457,067	145,365	152,830	112,679	867,861
1880	679,987	230,079	218,606	138,969	1,267,641
1885	562,447	112,995	194,644	90,870	960,956
1890	513,470	115,816	176,025	96,257	896,168
1897	498,048	90,584	129,297	85,166	796,495
1898	515,593	124,416	134,574	170,113	944,696
1899	628,037	107,342	150,483	205,479	1,102,240
1900	684,502	167,974		219,009	

SHEEP.

The enlargement of the movement of sheep is also very rapid, indicating great increase in consumption, which is quite out of proportion to increment of population. The following statement is from the records of the four centers of distribution, Chicago, St. Louis, Kansas City, and Omaha:

Receipts and shipments of Western markets.

Years.	Chicago.		St. Louis.		Kansas City.		Omaha.	
	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.
1870	349,853	116,711	94,477	11,640				
1875	418,948	243,604	126,679	37,784	25,327	17,742		
1880	335,810	156,510	205,969	93,522	50,611	36,285		
1885	1,003,596	260,277	362,858	223,391	221,801	115,755	18,985	8,498
1890	1,008,790	266,912	228,985	202,728	172,250	83,234	40,195	17,728
1897	1,360,962	445,064	417,425	287,018	209,956	108,126	76,014	56,444
1898	1,515,014	601,241	456,669	316,076	351,050	169,932	158,503	118,208
1899	1,832,460	711,315	358,495	255,375	370,772	174,851	159,508	103,250
1900	2,182,607	929,854	358,506	232,151	435,869	336,207	156,186	94,464

The following are the aggregates of these records of receipts and shipments:

Years.	Receipts.	Shipments.	Years.	Receipts.	Shipments.
1870	444,330	126,360	1897	2,064,267	891,632
1875	509,954	229,130	1898	2,481,296	1,206,067
1880	592,390	226,317	1899	2,721,230	1,244,791
1885	1,607,242	617,831	1900	3,233,228	1,612,676
1890	1,550,629	570,603			

Receipts of Eastern cities.

Years.	New York.	Boston.	Philadel- phia.	Baltimore.	Total.
1870	1,463,878	420,007	592,073	173,000	2,648,958
1871	1,225,008	372,350	494,540	194,685	2,286,583
1881	1,656,965	478,785	623,464	248,917	3,008,131
1882	1,848,377	639,847	616,573	178,712	3,283,509
1883	1,967,731	561,000	566,879	319,845	3,415,455
1884	2,025,115	551,476	556,372	237,436	3,370,399
1885	1,892,783	538,430	564,612	438,940	3,434,765
1886	1,803,805	543,430	537,431	421,951	3,306,617
1887	1,708,615	583,545	.....	881,025	.....

SWINE.

The effort in foreign countries to increase home supplies of swine aided by tariffs and edicts of exclusion, has prevented the extension of our foreign trade, and for a time reduced its volume. The exports of 1889-'90 have nearly reached the highest limit of ten years ago. The record is as follows:

Receipts and shipments of Western markets.

Years.	Chicago.		St. Louis.		Kansas City.		Omaha.	
	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.
1870	1,893,128	924,453	310,860	17,156	36,000	No record	.....	.....
1871	3,912,110	1,582,645	625,569	126,722	63,350	15,780	.....	.....
1880	7,027,355	1,304,960	1,840,084	770,769	676,477	132,920	.....	.....
1881	6,237,535	1,737,446	1,455,535	780,487	2,329,718	801,102	.....	71,70
1882	6,718,761	2,020,784	1,254,471	540,362	2,264,494	538,033	350,486	185,20
1883	8,470,852	1,812,001	1,052,340	324,745	2,423,362	524,492	1,011,706	169,71
1884	4,941,712	1,751,829	930,390	234,869	2,008,994	413,587	1,283,600	350,20
1885	6,983,526	1,786,639	1,120,090	430,310	2,073,910	531,434	1,506,605	170,50
1886	7,993,828	1,965,700	1,350,789	607,832	2,665,171	658,227	1,013,514	275,00

Years.	Receipts.	Shipments.	Years.	Receipts.	Shipments.
1870	346,850	17,156	1887	9,359,100	2,801,20
1871	4,604,020	1,735,152	1888	9,144,529	2,760,30
1881	9,576,516	2,318,679	1889	10,369,971	3,712,32
1882	10,892,655	3,460,014	1890	13,562,102	3,457,39
1886	10,638,303	3,346,580			

Receipts of Eastern cities.

Years.	New York.	Boston.	Philadel- phia.	Baltimore.	Total.
1870	890,625	180,330	180,500	200,000	1,551,455
1871	1,388,517	331,980	243,300	279,631	2,243,428
1880	1,719,137	691,833	848,960	336,897	3,596,827
1881	1,919,023	730,332	826,466	366,891	3,836,712
1882	1,989,656	990,787	823,842	229,643	3,999,928
1883	1,701,531	1,039,692	829,561	504,619	3,605,403
1884	1,540,837	1,063,827	844,719	618,959	3,678,342
1885	1,761,623	1,148,374	601,434	772,930	3,684,361
1886	2,126,440	1,021,175	.....	637,107	.....

PROGRESS OF AMERICAN DAIRYING.

The only general enumeration of cows is that of the United States. A few of the States report assessors' returns, which are more or less complete. That of the United States includes only cows on farms, and not those in towns and villages. The real number of cows in the country is therefore the number returned by the census plus the number not on farms or ranches, and plus the omissions of the enumeration, which are probably not large in this case.

The census returns of product did not include milk sold in 1850 and 1860, and only butter and cheese made on the farm. Butter factories were then practically unknown, and cheese factories in process of organization, and not included in census schedules. The amount of milk sold for all purposes, from farms, was relatively small, yet some allowance should be made for it in comparing the dairy products, especially with reference to aggregate milk production of the census years.

In this comparison the butter and cheese are reduced to milk, on the basis of 3 gallons of milk to 1 pound of butter, and $1\frac{1}{4}$ gallons of milk to 1 pound of cheese. The best dairies do a little better than this, but the average of all, including farm dairies, is so near these figures that it is impracticable to make any reduction from them. Even in the New York dairy tests the churnings of selected dairies in the local conferences, which are really perambulating dairy schools, the averages range from 15 to more than 30 pounds, and in 1889 averaged 21.04 pounds. Selection and breeding have considerably reduced the ratio of milk to butter in the best dairies during the past thirty years, which, unfortunately, are in so small proportion to the whole number of cows that the general improvement is slow. The census records of butter and cheese are thus reported:

Years.	Butter.			Cheese.		
	Farm.	Factory.	Total.	Farm.	Factory.	Total.
1850.....	313,345,306	.....	313,345,306	103,535,803	.....	103,535,803
1860.....	459,681,372	.....	459,681,372	103,663,927	.....	103,663,927
1870.....	514,092,683	.....	514,092,683	53,492,153	109,435,223	162,927,376
1880.....	777,250,287	29,421,784	806,672,071	27,272,489	215,685,361	243,157,850

Reducing the butter and cheese to milk, and adding 235,500,599 gallons of milk sold to factories and milk dealers, according to the census of 1870, and 530,129,755 gallons thus returned by the Tenth Census, the following aggregates of milk and averages per cow are obtained:

Years.	Cows.	Gallons of milk.	Gallons per cow.
1850.....	6,385,094	1,063,161,127	167
1860.....	8,585,735	1,499,965,364	175
1870.....	8,935,332	1,840,186,160	206
1880.....	12,443,130	2,893,698,520	233

These figures must not be received as the actual average yield of milk per cow, because the milk aggregate does not include that used

in the form of milk in the families of farmers. This factor in the problem can only be determined approximately. The proportion is smallest in the great dairy sections and largest in the States where butter and cheese are made in small quantities. In New York it has been estimated on the basis of the milk of one cow to each farm which would give nearly the product of five cows for the market, one for home consumption. As the dairy cows yield more than 11 farm cows, it might be fair to consider the ratio as six to one. On this basis the milk in products sold in New York in 1879 was equivalent to 491.6 gallons per cow, the milk used 66.9, making the total per cow 468.5 gallons. There should be a slight improvement in ten years, a portion of the stock, while there may be none in a much larger portion. Less than 2 per cent improvement would bring the average up to 475 gallons per cow, which is the maximum probability.

In some States, where cows are relatively few and the rates of yield small, at least two or three times as much milk is used in the natural form as is converted into butter and cheese. A definite estimate may not be practicable, but on the assumption that one fifth of the milk produced is consumed as such on the farm, the average yield per cow in 1880 would be about 291 gallons. This would make the milk product of farms 3,617,123,150 gallons. Add to this the milk of cows in villages and towns and the total probably exceeds 4,000,000,000 gallons. This refers to the milk of 1880. At the present time, with 16,000,000 to 17,000,000 cows—as there must be if all are counted—the aggregate milk produced undoubtedly approximates 5,000,000,000 gallons.

The prominence of a few States in dairying is presented strongly by the fact that ten States produce about two thirds of the butter and include more than half of the cows of the United States.

In the summary of products a remarkable change appears in cheese. In 1870 there was reported a product of 199,435,229 pounds, made in factories, in addition to 53,492,153 pounds made on farms. The farm product of 1880 was 103,663,927 pounds, which was all the cheese reported. In 1880 the farm product was still further reduced to 27,272,489 pounds, but the factory product was increased to 215,885,360.

In 1860 the factory system of cheese making, or associated dairying, began to attract general attention. Factories were in operation in Oneida County, New York. The system was originated by Jesse Williams, a farmer living near Rome in that county. He was an expert cheese maker and his product was eagerly sought by dealers being far superior to the make of neighboring farms. The idea of the factory was accidental. Mr. Williams had contracted his cheese and that of his son, who had just entered upon dairying on another farm, at 7 cents per pound, a figure above the prevailing price. The son doubted his ability to make cheese of the desired quality, and it was finally arranged that he should bring his milk to his father's dairy. This suggested the thought that the neighbors might also bring their milk, which soon led to the erection of a factory building and proved to be the pioneer of the cheese factories, which now represent the American system of coöperation in dairying. In 1861 a few more factories were built, and from two to four each succeeded in a year, until 1860, when seventeen were added to the twenty-one already in existence. In 1866 the number had increased to five hundred in New York, the larger number being built in 1863 and 1864.

As indicated heretofore, the census returned only butter and cheese in 1850 and 1860, the milk sold from farms being almost inappreciable in amount except in the vicinity of large cities. Since the rise

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of associated dairying, the milk sold to factories, with that distributed for consumption in families, has added another item to the census count, that of milk sold. Reducing the butter and cheese to milk equivalents and adding milk sold, the milk produced per cow has been as follows:

States and Territories.	1880.		1870.		1860.		1850.	
	Number of cows.	Average yield per cow.	Number of cows.	Average yield per cow.	Number of cows.	Average yield per cow.	Number of cows.	Average yield per cow.
		<i>Galls.</i>		<i>Galls.</i>		<i>Galls.</i>		<i>Galls.</i>
Maine.....	150,845	314.2	139,269	270.2	147,314	252.3	133,556	228.0
New Hampshire.....	90,564	313.8	90,583	234.5	94,880	247.4	94,277	261.6
Vermont.....	217,033	387.3	180,285	349.5	174,067	328.0	146,128	318.8
Massachusetts.....	150,435	306.2	114,771	327.4	144,492	215.0	130,099	249.7
Rhode Island.....	21,460	333.0	18,800	258.6	19,700	166.3	18,698	179.5
Connecticut.....	116,319	335.4	98,880	290.9	98,877	277.2	85,461	301.3
Total.....	746,656	353.9	642,593	300.5	679,930	254.3	608,219	268.7
New York.....	1,437,855	401.6	1,350,661	358.2	1,123,634	325.7	981,324	319.3
New Jersey.....	152,078	289.9	133,331	226.6	138,818	223.1	118,786	243.3
Pennsylvania.....	854,156	322.8	706,437	280.6	673,547	235.6	530,224	231.1
Total.....	2,444,089	367.1	2,180,429	325.2	1,935,999	298.1	1,580,284	254.0
Delaware.....	27,294	247.9	24,082	177.5	22,595	190.3	19,248	164.7
Maryland.....	122,907	221.3	94,794	174.8	99,403	158.9	86,856	131.5
Virginia.....	243,061	147.0	188,471	113.0	330,713	123.1	317,610	106.3
Total.....	393,262	177.2	307,347	137.1	452,711	134.3	423,726	114.2
North Carolina.....	232,133	95.4	196,731	66.1	228,622	62.4	221,799	56.6
South Carolina.....	130,881	70.5	98,093	46.9	163,938	58.2	193,244	46.3
Georgia.....	315,073	72.0	231,310	58.9	209,688	54.5	334,223	41.8
Florida.....	42,174	26.2	61,922	4.9	92,974	13.3	72,876	15.6
Total.....	729,261	76.5	586,656	53.6	785,223	52.7	822,142	44.5
Alabama.....	271,443	89.4	170,040	57.1	230,537	78.5	227,791	53.0
Mississippi.....	208,178	85.0	173,809	45.2	207,646	72.4	214,231	61.0
Louisiana.....	146,454	30.6	102,076	17.8	129,662	33.5	105,576	19.4
Texas.....	606,176	71.0	423,048	26.3	601,540	29.7	217,811	32.8
Arkansas.....	249,407	95.1	128,959	64.3	171,003	71.5	98,151	60.1
Tennessee.....	303,900	180.3	243,107	120.5	249,514	121.1	250,456	98.3
Total.....	1,845,558	93.0	1,346,819	54.7	1,589,903	61.5	1,109,016	58.2
West Virginia.....	156,956	183.5	104,434	146.7	.....	.....	.....	.....
Kentucky.....	301,832	189.5	247,615	149.9	269,215	131.4	247,475	121.6
Ohio.....	707,043	328.8	654,390	279.0	676,585	252.5	544,499	224.4
Indiana.....	494,944	241.0	393,736	177.8	363,563	153.0	294,554	138.4
Illinois.....	805,913	239.7	640,321	186.5	522,634	165.2	294,671	132.6
Total.....	2,586,738	257.1	2,040,496	208.0	1,831,987	190.0	1,371,199	172.2
Michigan.....	384,578	324.7	250,859	304.0	179,543	269.7	99,676	224.5
Wisconsin.....	478,374	267.3	308,377	231.3	208,001	207.5	64,339	176.7
Minnesota.....	275,545	216.3	121,467	239.1	40,344	225.7	607	5.4
Total.....	1,138,497	274.4	680,703	259.5	422,888	235.7	164,622	205.0
Iowa.....	854,187	215.0	369,811	228.5	189,802	194.6	45,704	147.9
Missouri.....	601,405	134.9	318,515	111.6	345,243	111.3	230,169	103.1
Kansas.....	118,333	160.0	123,440	125.8	28,550	116.1	.....	.....
Nebraska.....	161,187	186.6	28,940	164.7	6,995	149.0	.....	.....
Colorado.....	28,770	107.8	25,017	49.5	.....	.....	.....	.....
Total.....	2,123,832	175.6	945,723	159.1	570,590	130.7	275,873	110.6
California.....	210,078	274.2	104,093	192.4	206,407	52.8	4,390	0.5
Oregon.....	50,540	129.9	48,325	92.2	53,170	58.7	0,427	71.9
Washington.....	27,622	160.1	16,938	74.6	9,660	49.0	.....	.....
Nevada.....	18,319	88.3	6,174	64.2	947	24.4	.....	.....
Total.....	310,568	228.4	225,530	160.0	269,184	54.0	13,707	40.6

States and Territories.	1880.		1870.		1860.		1850.	
	Number of cows.	Average yield per cow.	Number of cows.	Average yield per cow.	Number of cows.	Average yield per cow.	Number of cows.	Average yield per cow.
Arizona	0,156	Galls. 27.2	539	25.7	.....	.....	.....	.....
Idaho	40,572	159.3	4,151	152.1	296	122.6	.....	.....
District of Columbia	1,232	433.1	657	212.4	629	288.4	813	.....
Idaho	12,838	75.7	4,171	61.1	.....	.....	.....	.....
Montana	11,308	116.5	12,432	109.3	.....	.....	.....	.....
New Mexico	12,935	12.1	10,417	4.3	24,309	2.4	10,637	.....
Utah	32,768	105.6	17,563	28.3	11,907	64.4	4,101	.....
Wyoming	8,730	105.1	707	12.1	.....	.....	.....	.....
Total	124,610	108.9	57,035	61.3	47,301	24.5	16,553	.....
Grand total	12,448,120	122.5	8,935,232	206.9	6,585,710	114.7	6,585,710	.....

In examining this table it should not be forgotten that the milk used as such on farms is not included. This might be, in New York one sixth as much as that manufactured and sold, and in some of the non-dairying States a still larger proportion than that manufactured and sold. After making all possible allowances, there will still be a great difference between the yields of different States, ranging from 470 gallons in New York to less than 170 gallons in some of the Southern States.

It is a noticeable feature of this table that the yield increases from decade to decade. It is evident that the advance is not due entirely to the increasing accuracy of the returns, or to the milk sold introduced into the later enumerations. The attention given to selection and breeding has increased the rate of yield, and to some extent the proportion of butter-fats. The relation of milk to butter varies widely in different breeds, and in individual cows of the same breed. The experience of Hon. Zadoc Pratt, thirty years ago, affords a good illustration of this fact, and of the low average butter yield of the unimproved farm cows of that period. His farm was a large one of 365 acres, formed originally from hemlock clearing among the hills of the northwest corner of Greene County, near Delaware. In 1857, with selected cows averaging 636 gallons, the average milk to 1 pound of butter was 39.2 pounds. He saw the necessity of getting cows with richer milk, and his average was 32.33 in the next year, and 29 in the year following. In 1860 the ratio was 23.3 to 1, and in following years successively 21, 19.7, and 20 pounds. The quantity of milk per annum was slightly reduced, but the yield of butter was nearly doubled.

The most hopeful and promising effort looking to practical results in the education of the future butter makers of the farm is the modern dairy school. New York has instituted a series of "dairy conferences," which continued last year through the summer, from May 30 to November 15, under the instruction of Messrs. W. H. Gilbert, F. D. Curtis, E. S. Munson, and H. Cooley Greene. There were twenty-nine meetings held, at which two or three examples of butter-making were given, with rarely less than 200 pounds of milk each, 69 churnings averaging 319 pounds, and yielding 1 pound of butter to every 21.04 pounds of milk. Many important points are illustrated by these ever-varying results. The wide differences in butter yield of different dairies, of different breeds of cows, and in

individuals of the same breed are illustrated distinctly and impressively in these tests. The great disparity in time required for churning, the various temperatures of the milk in creaming and of the cream in churning, the implements and appliances for setting the milk, the rations fed and methods of feeding, furnish themes for discussion and originate suggestions for thought and study, and lead to questions not easily answered and problems of science and practice not readily solved.

When such a series of conferences includes a churning which produces a pound of butter for less than 13 pounds of milk, while another requires more than 32 pounds of milk to make one of butter, it suggests in the latter case the prompt services of a butcher or the ultimate necessity for a mortgage or a sheriff's sale. As might be expected, the Jerseys led in butter product; six of the churnings were of pure Jersey milk, one producing a pound of butter for 12.77 pounds of milk and another a pound for 19.5 pounds, the average being 15.88 pounds. The Jersey grades were nearly as good, in only one instance a low grade requiring 20 pounds, and in one case less than 15 pounds. The natives were variable, some of them excellent, one requiring only 19 pounds, while one required 32 pounds. It is costly ignorance which feeds and milks and shelters two cows without knowing that more butter can be produced at the cost and care of one.

These dairy schools should offer to every ambitious boy and girl of the farm dairy a practical and ample curriculum of economic science. They are as yet only germs of the good of which they are capable when enlarged and perfected as they may be in the future.

THE DOMESTIC FOOD SUPPLY.

Relative to the prospective food supply there are two classes of extremists, optimists and pessimists, each enforcing conclusions by statistics. One maintains the theory of the possibility of practically unlimited food production, and the desirability, both from pecuniary and philanthropic considerations, of "feeding the nations of the world," thus preventing a glut in our own markets and such a fall in prices as to destroy all profit in production. The other claims that consumption is overtaking production, and will soon require foreign aid in maintaining supplies. Now in certain products in years of abundant yield, there has been such a surplus as to render unprofitable the labor of cultivation, and at the same time there has been an insufficient supply of other food products always grown here, and a failure to produce still others which might be, and which are now imported. So there is a color for each claim. But a broad statement of either view is unsupported by the logic of current agricultural statistics.

It is easy to draw hasty conclusions from such statistics, especially from the extraordinary data of the past thirty years, which are sure to prove unreliable and misleading. The abnormal demand arising amid civil war; the impelling force of high values during the cotton famine in pushing the extension of cotton area; the inflation of a subsequent period, ending in collapse; the remarkable era of cereal dearth in Western Europe; all these and other influences tended to general increase of product, with occasional fluctuations. Hence it has been easy to draw deductions which the facts of the future can

not be depended on to sustain. Twenty-one years ago veteran planters maintained in elaborate argument that 3,000,000 bales of cotton could never again be grown, but the fact refuted the prophecy in a single year, and the product has now passed 7,000,000 for seven years. Others insist that the limit of area and product of wheat has been reached, because the breadth of nearly 40,000,000 acres of a years ago has not been maintained, and the product of 1880 scarcely four fifths as much as that of 1884. The fact is too easily forgotten that areas fluctuate in obedience to changes of value; the flocks are slaughtered while herds are enlarged, and *vice versa*, prices of meat and wool go up or down. One can with difficulty foretell what may happen in American agriculture, even when he knows all the circumstances which shall affect its results. The comparative stability of crop areas and rotations of some European countries not to be expected in the United States, where rotation is almost unknown, and prospective profit controls the annual distribution. This fact injects an element of difficulty and uncertainty into statistics of agriculture.

While the public land areas are greatly reduced, and the proportion of improved lands of the older States is larger than ever, it is perfectly safe to assume that there is no ground for the pessimistic theory that our lands have all been taken up, that fertility is declining, that cultivation can not be extended, and foreign aid must be sought to meet the wants of advancing population.

The old tale of the wheat movement westward, as a sort of John Gilpin cereal race for the goal of the Pacific coast, with the Genesee Valley as a starting point, has been told and retold, though it has more point now than when it was first presented. The sole meaning of the movement is that the pioneers of agricultural settlement have been wheat growers, and exclusive wheat growing has been the advance guard of agricultural forces in this country, keeping even step with progressive movement along the westering path of settlement. The country left behind grows as much wheat as before, the country nearest sunset grows all the more, and so the rapidly increasing aggregate is made to meet the wants of advancing population. The old area requires variety in cropping, and, if held by an intelligent yeomanry, gains in fertility by rotation and fertilization; the new must be subdued with the least labor and capital, a requirement which is met by wheat, a cash crop, which bears transportation better than any other cereal product. This explains why the center of wheat growing has moved gradually westward until it has reached the Mississippi River, but it does not prove that the soil is exhausted, that the area of Eastern productive land has reached its limit, that the rate of yield of farm products has attained its maximum, or that farming can no longer be profitable east of the Mississippi. More of the Eastern farm land will be made productive, and larger yields will be obtained by higher skill and more scientific methods.

The scale of living of farmers and others has been greatly advanced during the past fifty years. The supply of wheat in proportion to population has been nearly or quite doubled, some of it exported but also much more consumed per head than formerly. In 1849 the production was 4.33 bushels per head; in 1879 (and again in 1884) 9.16 bushels. The increase of population in this period of thirty-five years was about 140 per cent, while the increase in wheat production was 410 per cent. This was abnormal, in part due to temporary demand of extraordinary proportions. It will not do to have

deductions of future wheat production upon irregular and unusual data; nor, on the other hand, is it safe to assume that our farmers will not supply a liberal domestic demand for a long time to come.

Corn, as a native American product, of nearly universal distribution, has always been in great abundance and wastefully profuse in consumption, yet the average per head of 25.5 bushels in 1849, has been increased, and in medium to abundant years averages from 30 to 33 bushels per head. As the exportation averages only 1 bushel in 25, the rate of consumption has materially increased.

So with many other products, meats especially. With an increase of rate of population that has excited the wonder of the world, there has been a material advance in consumption of food products and a corresponding increase in that of clothing. The following extracts from a nonofficial exposition of this question by the Statistician will throw further light upon this subject:

In the use of food our people are profuse and even wasteful. All classes use meats freely, ordinarily three times daily. A great variety of fish, oysters that have a fame extending beyond seas, and various forms of the crustacea enrich the national dietary. According to accepted statistics Great Britain consumes an average meat ratio not over two thirds as large as the American, France scarcely half as large, Germany, Austria, and Italy still less.

The American negro, even in the days of slavery, was usually allowed a weekly ration of 3 pounds of bacon and a peck of meal, besides vegetables and other products either of the plantation or his own garden patch. This made at least 150 pounds per annum, not to mention the occasional opossum and chicken that were respectively his legitimate game and his illegitimate plunder; and this amount of meat is more than the average consumption of any European nation, and two or three times as much as the average ration of several of them, including with the peasant and artisan, the citizen and nobility.

The average consumption of meat in the United States is probably not less than 175 pounds per annum. Of other civilized nations only Great Britain exceeds 100, and many of them scarcely average 50 pounds. The consumption of the cereals, by man and beast, is three times as much, in proportion to population, as in Europe. For the past ten years the average has been 45 bushels for each unit of population, while the usual European consumption does not vary greatly from 16 bushels per annum. While all is not used as food for man, no small part of it contributes to the meat supply.

The average consumption of wheat for bread is nearly 5 bushels, and about 3 bushels of maize and 1 bushel of oats and rye, or approximately 9 bushels for each inhabitant. The average European consumption of wheat is about 3.5 bushels. In the consumption of fruits the difference between this and other countries is marked with unusual emphasis. Small fruits, orchard fruits of all kinds, and tropical fruits, as well as melons of many varieties, are in profuse and universal daily use in cities and towns, and in the country the kinds locally cultivated are still cheaper and more abundant in their respective localities, though scarce in the regions of recent settlement and those unsuited to a wide range of species.

The consumption of vegetables is not excessive. The products that are rarest and dearest are those which are advancing in relative prominence in the dietary of the people. Variety and quality in food products are the points in which progress has been continuous and extensive. Not unfrequently skilled mechanics or miners, making high wages, are more fastidious and profuse in their marketing than citizens living upon the profits of capital. The abundance and variety of every form of food production, and the general distribution of means for procuring it lead to profusion and tend to wastefulness.

The American people are no less profuse in clothing than in food. This country is a favored land in fiber production. More than \$400,000,000 is the comfortable sum which represents the present fiber products, in the form of cotton, wool, hemp, and flax. There is also experimental production of silk, ramie, sisal, jute, and many others suited to the climate, some of which will ultimately become the foundation of industries.

More than half of the material for the cotton factories of the world is grown here, and a third of that is manufactured and mostly consumed at home. If 65,000,000 people require one sixth of the cotton manufactured in Europe and America for the use of nearly 450,000,000 inhabitants of these continents, and of the millions in

India, China, Japan, and other countries obtaining supplies from the factories of Christendom, the disparity in consumption between this and other countries must be great indeed.

With an average per capita consumption of 17.5 pounds of cotton, 8.5 of wool, and a large quantity of silk, linen, and other fibers, the claim of superiority in supply of clothing can not well be disputed. Thus one twentieth of the population of the world consumes nearly a fourth of the wool product of the world. If the people of Europe should demand an equally liberal supply the earth might be secured in wool for the requirements of such a consumption. As they do not, it may be supposed that a larger proportion of cotton would be needed; but a consumption equal to that of this country would not leave a pound for North or South America, Asia, Australasia, or Oceania.* Indeed it would not suffice for more than a supply of 15 pounds per head to Europe alone.

Can this supply be kept up, or is the pressure of population on subsistence about to manifest itself? It would be a disgraceful imputation upon our agriculture to admit it. Scarcely more than a third of the South is included in farms, and the proportion of farm land in Maine is no larger. The land in the West is not all taken, and an immense area of arid lands can be irrigated and made highly productive. Then a considerable area of farm lands is not now utilized in production, and much of the tilled land is not half cultivated. High culture upon a scientific and common sense basis might increase materially if not double the present rate of yield. It will be time enough to talk of importation of food products when our population is five times as large as at present. The following extract further enlarges upon this theme:

With 9,000,000 farmers and farm laborers, cultivating over 5,000,000 farms, but a third of the land is taken up, but a small part of that is under crops, and the area under nominal cultivation is superficially treated and scarcely up to half its maximum production. There is nothing surprising in this. Cultivation is always primitive where land is cheap, before land speculation gives place to scientific agriculture. For this reason the richest lands are often found to give the lowest yields, for the reason the average wheat yields of the prairies of Iowa are less per acre than those of the granite hills of the East.

WAGES OF FARM LABOR.

It was thought possible that the wages of farm labor might be affected somewhat by the low prices of certain farm products—of corn and oats especially. This investigation is made in the spring, usually once in three years, but it was deemed advisable, on account of the complaints of low prices and hard times, to make the inquiry in 1890, though the previous one was instituted in 1888, and thus ascertain what effort, if any, had resulted in reduction of the rate of wages of labor.

The investigation showed no material decline in wages. Employers generally insisted that they were too high, and in many instances the tendency to reduce the amount of service was indicated; yet there was very little actual reduction, by no means enough to affect perceptibly the farm labor market. It is evident that the industries of the country are still in a comparatively prosperous condition, and that there is not a very large proportion of labor unemployed. Everywhere there is a pressure of competition with farm labor, withdrawing laborers from rural engagements and leaving to the remainder fair wages. In some places farmers complain that

* Ellisen in his "Cotton Trade," makes the average weight of cotton goods consumed annually 5.68 per head. Belgium uses 9.8 pounds; Great Britain, 7.56; Germany, 7.53; Austria, 5.27; Italy, 5.06; Russia, 3.31, etc.

the more intelligent and skilled are withdrawn, and that they are compelled to pay higher wages than they can afford.

Farm wages in New England are slightly advanced as compared with the rates two years ago. Farm laborers prefer to go to the cities and find employment in cotton factories, machine works, shoe shops, or in other business. In northern districts lumbering, the ice business, and shipbuilding on the coast compete with farm work. There is much complaint of scarcity of intelligent labor.

Some report an abundance of foreign labor, which is characterized by many as unreliable. Laborers of this class require too much instruction and supervision.

In New York a similar scarcity exists. In some districts it is estimated that laborers obtain about one third more wages in other trades. This is natural and equitable, as the expenses of living are higher in towns. Farmers try to do their work with as little hired labor as possible, to avoid the expense of skilled labor and the annoyance of unskilled. They say that a majority of the laborers are looking for an "easy job." The demand for labor on railroads, at the oil wells, cement works, and in factories withdraws the more efficient laborers from the farms.

In New Jersey the usual manufacturing demand for labor is supplemented by the requirements of railroads, of watering places, of the oyster and clam business, and that of various fisheries.

Various causes of scarcity prevail in Pennsylvania. The coal and oil regions compete strongly, as do the furnaces and rolling mills, sawmills, bark mills, and various lumbering operations. Farmers say they can not afford to pay the wages which labor commands in these industries. Of course the feeding of the multitude otherwise makes a better demand and higher prices for agricultural products, with the limitation of the pressure of Western competition in the staples that can be readily transported long distances. Not a few counties, however, report a supply of labor equal to the demand.

In Delaware and Maryland there is also competition from factories, and from the oyster business on the eastern shore of Maryland, and from lumbering in the western mountain area. The Howard correspondent says: "It is abundant, but more worthless every year."

It is gratifying to note the activity of the demand for labor in mining and manufacturing, fisheries, and other industries, which has increased the rate of wages in Virginia, and made a demand for farm products. In some counties there is still a supply of farm laborers. In others a scarcity is noted. The tendency among young colored men to seek summer employment in Northern States is noted. Some farmers complain of its cost and decry its efficiency.

In the cotton States very few laborers are employed during the year at given rates in money. Those working on plantations prefer to work at shares of produce, under contracts greatly varying in terms. On the Atlantic coast there is a tendency to emigration westward, and also to working on shares. The turpentine business is moving down the coast and westward, causing the removal of able-bodied men from North Carolina, while those who remain, sometimes the women left behind, attempt to carry on farms, often running into debt with disastrous results. In South Carolina railroad enterprises and phosphate mining attract labor by higher remuneration. There is evidence of increased demand for labor in Georgia, Alabama, and Tennessee, in iron and coal mining, in fur-

naces and factories, and in other enterprises. It is an unusual experience, in the previous history of industry in Alabama, which Hale correspondent indicates, "Most able-bodied men are won in mines, furnaces, and on railroads."

In one instance the abundant crop of last year is charged with producing a scarcity of labor, because while the means of the laborers hold out they will not work on farms.

In Mississippi there is in general a good demand for labor. Young white men leave the farms and become teachers or engage in mercantile pursuits, and colored laborers go to Louisiana or to the swamp region, from the settled portions of the State. In the parish of St. Mary, Louisiana, labor is abundant and reliable, good feeling existing between them and their employes. Labor is generally reported scarce in Texas, as the laborers wish to cultivate land of their own, either plantations cut up and leased on shares or cheap lands in the western part of the State. In some parts of Texas it is said that farmers are "too hard pressed for money to have help," and that they "can not afford to borrow money at 12 per cent to pay for hired help." Labor here is augmented by immigration of Bohemians and Germans.

In Western Texas many Mexicans are employed. Much land is unoccupied in parts of Texas for want of labor to cultivate it. The correspondent refers to the negro as the best cotton maker, but is discontented with a bare living. In Kaufman County "hundreds of acres will be uncultivated this year from scarcity of help." This scarcity and low prices have so discouraged farmers that they have mortgaged their farms to loan companies or abandoned them. There is a fruitful region in Arkansas, where labor is abundant, because the "small farms have more boys than tillable land or hired help." Throughout the South it is easier to find transient or temporary labor, day labor, than regular employment by the month throughout the year.

Labor is somewhat scarce in West Virginia, owing to the activity of lumbering and coal-mining operations. In some counties in Kentucky labor is abundant, in others scarce, where laborers have turned into other industries. There is some complaint of lack of reliable labor.

There is abundance of work and plenty of workers in Ohio. In central county, Franklin, reports that "every man in the county has work every day if he chooses." Yet there are local suggestions of deficiency as well as of abundance. It is held by some that from the farmer's standpoint, in view of the prices of products, the labor is too high.

Many reporters in the West think wages are higher than the results of farming warrant, and that consequently farmers employ more help than is absolutely necessary. There is in most places a real scarcity, yet a good demand exists, stimulated by competition in lumbering, coal mining, railroading, and in the various industries of cities. Good help is scarcer than poor in the West as everywhere else. There is no difficulty in finding employment at fair wages for all skilled labor throughout the central valley region. In part of Wisconsin the influx of Germans, Swedes, and Norwegians creates a superabundance of labor. One correspondent in Minnesota refers to the interesting fact that farmers' sons occupy their own land, thus reducing the demand for hired laborers. The self-binder has been a great boon in the harvesting of wheat, enabling the grower to do his work with fewer harvest hands. In many places farmers "chase

work" with their neighbors, combining their forces for harvest work, and with the aid of their machines avoiding the employment of harvesters by the day. This has reduced the excessive wages formerly demanded by harvesters in the great wheat regions. In Howard County, Missouri, a superabundance of colored laborers is reported, who will not work on farms, and it is claimed that "a thousand good, honest white men and women can find pleasant homes at remunerative wages."

On the Pacific coast the use of farm machinery is reducing the number of laborers employed, and the rate of wages, though still higher than in other States, has been materially reduced. There seems to be a tendency towards ownership of land by laborers, which is reducing the number employed. There is considerable immigration into Oregon, which increases the supply of labor there. Labor is fully employed in the Rocky Mountain region and in some places it is scarce. There is great activity in business of all kinds in the arid region and great promise of future development.

The result of the whole investigation indicates a fair, if not full, employment of farm labor, at wages substantially the same as two years ago. It is suggestive and hopeful to note the increase of industrial activity in the South and West, more general and various than ever before, not only employing surplus rural labor, but making demand for the products of agriculture where they are grown. There is complaint of low prices of corn and oats, and thence in less degree of pork products, but wheat is higher than two years ago and meats about the same as at the former investigation. A bad season, which would reduce the corn crop 30 per cent, would increase its price 40 or more, and of oats nearly as much. The depression, therefore, is only partial and probably temporary, and has not reduced wages of farm labor, partly because there is still a firm demand for the best quality, and partly because of the general industrial prosperity, which has a favorable reflex influence upon agriculture.

The sectional averages for each period of investigation are as follows:

Sections.	1800.	1868.	1885.	1882.	1879.	1875.	1869.	1866.
Eastern States.....	\$26.64	\$26.03	\$25.30	\$26.61	\$30.21	\$28.56	\$32.06	\$33.30
Middle States.....	23.62	23.11	23.19	22.24	19.69	20.02	22.02	30.07
Southern States.....	14.77	14.54	14.27	15.30	13.81	16.22	17.41	16.00
Western States.....	22.00	22.22	22.26	23.63	20.88	23.60	27.01	29.91
California.....	35.50	38.08	38.75	38.25	41.00	44.50	46.38	35.75
Average, United States.....	18.33	18.24	17.97	18.94	16.42	19.87	.....	.....

There have been only slight fluctuations in the average rates of wages since 1879, the period of lowest depression, which followed an era of currency expansion, speculation, and nominal high prices. Leaving out the Southern States, where negro labor depresses the average, the average rate would be \$23, which represents the wages of white labor more truly than the general average of the country.

WAGES PER MONTH BY THE YEAR.

The results of seven investigations, occurring at intervals between 1869 and 1890, are presented together in the following table, in which

the changes of twenty-one years in monthly wages are shown
glance:

[Wages given in dollars.]

States and Territories.	1890		1898		1905		1922		1927		1928	
	Without board.	With board.	Without board.	With board.	Without board.	With board.	Without board.	With board.	Without board.	With board.	Without board.	With board.
Maine	25.00	17.50	24.64	17.20	25.00	16.00	24.75	16.15	25.18	16.08	25.40	16.24
New Hampshire	25.15	17.60	24.58	17.00	24.80	15.75	25.25	16.72	25.75	16.25	26.07	16.35
Vermont	24.80	17.35	24.25	16.40	24.00	16.20	23.37	16.00	24.00	15.40	23.67	15.87
Massachusetts	30.00	18.50	29.50	18.00	30.00	17.75	29.50	16.18	29.25	15.33	29.87	15.87
Rhode Island	29.50	18.00	27.75	17.50	28.50	17.70	27.75	16.00	28.00	15.33	28.00	15.33
Connecticut	27.00	17.33	27.40	17.17	27.67	17.20	27.00	16.17	27.25	15.33	27.25	15.33
New York	24.45	16.65	24.13	16.20	24.00	16.22	23.65	15.36	24.01	15.13	23.77	14.77
New Jersey	25.10	16.00	23.33	15.73	23.60	14.10	23.24	15.20	23.25	14.53	23.77	14.77
Pennsylvania	22.80	14.60	22.24	14.50	22.50	14.12	22.86	14.21	23.02	14.40	22.85	14.40
Delaware	17.35	11.15	18.00	12.25	18.33	12.63	18.00	12.60	18.20	12.33	18.33	12.33
Maryland	17.07	11.25	18.48	11.84	18.30	11.50	18.34	11.60	18.00	12.33	18.11	12.33
Virginia	14.21	9.47	18.33	9.25	18.30	9.34	18.00	9.17	11.00	7.00	14.84	9.21
North Carolina	12.85	8.80	13.41	9.00	12.85	8.21	12.86	8.10	11.19	7.00	13.46	8.80
South Carolina	12.10	8.02	12.25	8.00	12.00	8.25	12.10	8.10	10.25	6.00	12.84	8.19
Georgia	13.13	8.37	12.60	8.81	12.47	8.73	12.80	8.70	10.73	7.36	14.67	8.73
Florida	19.35	12.59	18.00	11.33	17.80	11.37	16.64	10.20	13.80	8.73	15.50	10.73
Alabama	14.00	9.85	13.59	9.40	13.00	9.10	13.15	9.00	13.20	8.30	13.00	8.40
Mississippi	15.85	10.50	15.00	10.00	14.00	10.00	15.10	10.00	13.51	9.28	16.40	11.27
Louisiana	15.98	11.70	15.87	11.12	16.00	11.26	16.50	12.09	16.11	12.27	18.40	12.27
Texas	19.85	13.30	19.30	12.60	18.87	13.72	20.14	13.03	18.27	11.49	19.50	13.35
Arkansas	18.40	12.55	18.34	12.50	17.83	12.35	18.50	12.25	17.12	11.31	18.30	12.30
Tennessee	14.23	10.12	14.00	10.00	13.88	9.74	13.75	9.49	12.73	8.60	15.20	10.00
West Virginia	19.55	12.55	18.74	12.20	18.00	12.40	19.10	12.40	16.16	10.94	20.75	12.40
Kentucky	16.85	11.70	16.53	11.33	16.80	11.09	18.20	11.75	15.17	10.00	18.12	12.00
Ohio	22.10	15.10	22.21	15.00	22.00	15.50	24.25	16.20	23.72	13.34	24.15	15.33
Michigan	24.80	16.75	25.20	17.00	24.00	16.14	25.16	17.27	22.88	14.64	28.22	16.46
Indiana	22.25	14.78	22.50	15.30	22.50	15.30	23.15	14.30	23.12	13.00	23.10	14.30
Illinois	23.25	16.35	23.10	16.00	23.50	16.00	23.91	17.10	24.30	16.01	25.30	16.01
Wisconsin	24.50	16.75	24.05	16.80	23.54	16.78	23.21	17.00	23.07	18.83	25.50	16.45
Minnesota	24.00	16.00	23.75	15.68	23.50	16.73	23.66	17.35	24.37	15.62	26.16	16.30
Iowa	25.41	17.00	25.60	17.84	25.33	17.00	26.21	17.85	23.09	13.20	24.35	16.11
Missouri	30.25	14.00	21.00	14.33	21.35	14.50	22.39	13.55	17.50	11.84	19.40	13.24
Kansas	22.75	15.05	24.25	16.05	24.70	16.00	23.85	15.87	23.67	13.38	23.30	14.65
Nebraska	25.50	16.50	25.50	17.18	25.00	16.50	24.45	16.20	23.04	14.80	24.00	14.75
California	35.50	22.40	34.00	22.00	33.75	22.00	33.25	23.45	31.00	22.44	34.28	22.44
Oregon	31.60	22.60	32.50	23.00	33.00	23.21	33.25	23.50	34.35	23.45	35.38	23.45
Nevada	35.00	23.10	34.00	23.00	34.00	23.00	34.00	23.00	34.00	23.00	34.00	23.00
Colorado	33.75	21.00	33.00	21.00	33.00	21.25	33.50	21.00	33.00	21.00	33.50	21.14
Arizona	33.00	21.00	33.00	21.00	33.00	21.00	33.00	21.00	33.00	21.00	33.00	21.00
Idaho	34.75	21.10	35.18	21.25	35.17	21.60	35.17	21.60	35.17	21.60	35.17	21.60
Montana	36.25	23.50	36.25	23.50	36.25	23.50	36.25	23.50	36.25	23.50	36.25	23.50
New Mexico	37.50	21.83	38.75	21.83	38.75	21.83	38.75	21.83	38.75	21.83	38.75	21.83
Utah	32.50	21.00	33.50	21.00	33.50	21.00	33.50	21.00	33.50	21.00	33.50	21.00
Washington	37.00	24.40	38.25	24.40	38.25	24.40	38.25	24.40	38.25	24.40	38.25	24.40
Wyoming	34.00	23.00	34.00	23.00	34.00	23.00	34.00	23.00	34.00	23.00	34.00	23.00
Average	18.33	12.45	18.24	12.30	17.97	18.94	16.42	19.87	16.42	19.87	16.42	19.87

FLUCTUATION OF AGRICULTURAL PRICES.

A statistical analysis of prices of farm products for twenty or thirty years does not warrant the idea that prices have suddenly declined are much lower than formerly, or in unexampled depression. tables of quotations of various products show great fluctuation, rates in abundant years, high values in years of scarcity. The somewhat prevalent of a strong tendency to continuous decline is sustained by the record. The downward tendency of prices of farm products during thirty years has been far less conspicuous than decline of values of other products of human labor. This applies

farm products as a whole, rather than selected crops and exceptional years.

To specify principal crops, corn for ten years, average farm value, has been about 40 cents per bushel. From 1870 to 1879 it was only 2 to 3 cents more, and in gold value no higher than for the recent decade. Even in the decade from 1860 it was no higher in gold. But fluctuations occur in each period, as in the last, when 28.3 and 63.6 cents represent the value of largest and smallest crops respectively. The prices of wheat have been higher for three years past than for the three preceding. From 1876 to 1880 they were much higher from the unexampled demand due to the crop failures of Western Europe. The average of Chicago prices for three decades, expressed in currency, are nearly the same in gold for each, though there are annual fluctuations. The export price of cotton for the last fiscal year was about 10 cents per pound, while the average for ten years is only 10.5 cents per pound. Prices during the civil war were of course higher. The current rate depends entirely on the quantity marketed. Beeves are within two or three points of the prices of the last five years, the price of wool is advancing, fruits and vegetables command usual prices, higher if scarce and lower if abundant. The sellers get all they can for their share, as usual, and have facilities for combination to enforce their demands, which are not perceptibly greater than for several years past.

Thus we find nothing in the prices of farm products, either current quotations or their course and tendency in recent years, to warrant the assumed existence of any sudden, extraordinary, or permanent fall in values of farm products. We find that some are higher than they have been and still improving; that the national crop, corn, which has been plethoric in quantity, and therefore low in value, is higher than at any time since 1881; that hereafter, as heretofore, demand will control price, and the grower who caters to a new and rising demand, grows some product of which there is no surfeit, will obtain a more generous remuneration for his labor. Foresight in this matter, a wise departure from the conservatism of routine, and aptitude for deftness and skill in new lines of effort, will bring better prices and better times.

THE PRICE OF CORN.

The fluctuation in the price of corn has been great. It is not difficult to account for it. Prices depend on supply. With a variation in the supply of 12 bushels per head, or from 23 to 35 bushels, it is not strange that the average farm price should be 63.6 per bushel in one case and 28.3 in the other. In extreme scarcity the advance in price is out of proportion to the decline in supply. A fall of 522 million bushels in 1881 sent the price up 24 cents per bushel. An increase of 422 million bushels the next year caused a fall of 15 cents. It would have gone lower but for the exhaustion of old corn during the previous year. The next crop, nearly as large, averaged 6 cents less, and with increase of product in the two succeeding years the value declined 10 cents, and again rose 12 cents in two more years in consequence of successive diminutions of product. Then came the two largest crops ever grown, depressing the value, first from 44.4 to 34.1, and then to 28.3. Succeeding this is the present crop of only 24 bushels per head, causing a jump to 50.6 cents, an increase of 77 per cent. What more is needed to show that with crops small

enough the highest prices ever known can be obtained without slightest influence of the assumed tendency of the time to low prices.

The largest supply was in 1879, 1885, and 1889. In the latter year the largest exportation ever known in corn and cornmeal in pork products (to supply an alarming deficiency in Western Europe) aided in advancing the price heavily. In the latter the values were 32.8 and 28.3, the lowest of the list, yet not equal depressed, for one reason because of the large production of corn in 1888 and 1889, which is a crop that supplements corn and influences its price.

Going to the other extreme, that of the highest price, 63.6 cents in 1881, the smallest crop of the period is found, about half the 1889 in absolute quantity, but seven tenths as much in proportion to population. The supply per head was lowest at this time, and apparently but little higher in 1887, when the price was only 42 cents, but really the quantity for home consumption was much greater, because the foreign exports of corn and pork products were so much reduced, leaving a larger supply for home use. Could the exports of grain and secondary products be eliminated from the supply per head, and the remainder of each year be incorporated with the next crop, the relation between quantity and price would be still more striking, leaving little allowance for other causes affecting prices. It is with corn as with wheat, prices were reduced by keeping up the relative supply, while the exports have fallen. For five years the supply per head has been larger than for the previous five years, while the proportion exported as grain and lard has been less. A continuous oversupply, though the excess be small, suffices to glut and demoralize the market.

The average requirement, while exceedingly flexible, because depending so much on the abundance of other feeding material, may be taken to be about 27 bushels to each unit of population. Per the actual supply has been near 28 bushels, exclusive of exports. The average farm price for ten years has been 39.3 cents per bushel and for the preceding decade 42.6 cents.

Commercial prices in Chicago may be found on another page for the 1st of January in each year since 1860. Dividing into periods of ten years, and making a rough average of these January prices, a comparison can be made. The first period has an average of 35.5 cents per bushel, the second 43.6 cents, and the third 42.8 cents. The Chicago average for the last ten years is thus 3.5 cents less than the average farm price for the country, and the period ending in 1879 is just 1 cent lower than the farm price for the same period. An analysis of these Chicago quotations shows that price depends on quantity. Thus, in 1862 it was 23 cents; in 1865 it was 88 cents. In 1879, after several years of abundance, it was 29.8 cents, but in 1880, after a short crop, it was 66.3 cents. So, in 1890, after the largest crop grown and one of the largest per head, the price was 22.3 cents, while in 1882, after a very short crop, the figure was 62.5 cents.

We can have corn at 30 cents or at 60 cents per bushel, if we regulate the supply. Now, it would not be advantageous to farmers, in the long run, to keep corn at 60 cents, but it would equalize general prices and advance the general prosperity to keep it in the neighborhood of 40, or about the average of the last twenty years. This can be done by the farmers themselves, but only by restricting the supply to the requirements of the home market or increasing the foreign demand.

It is not asserted here that there are no other causes operative in modifying prices, but they are limited and obscure compared with the relative quantity of the supply.

The following table gives the average farm price of corn in the seven States having an annual surplus from 1876 to 1889, exclusive:

States.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>
Ohio	40	33	39	41	61	62	47	41	32	35	48	37	31	51
Indiana	34	27	34	40	60	48	41	34	29	32	45	31	27	47
Illinois	29	25	31	36	58	47	40	31	28	31	41	29	24	49
Iowa	25	16	24	26	44	38	32	23	24	30	35	24	19	41
Missouri	37	26	25	36	65	39	35	25	25	31	37	50	23	44
Kansas	21	19	27	29	58	37	26	22	24	37	37	36	18	51
Nebraska	18	16	21	25	39	33	24	18	19	20	30	22	17	48
United States..	35.8	31.8	37.5	39.6	63.6	48.4	42.4	35.7	32.8	36.6	44.4	34.1	28.3	50.6

The price in 1889 was lower in all these States than in any other year of this record, excepting that in Indiana, in 1878, it was the same and in the same year in Iowa and Nebraska a lower price was reached. There was discouragement and depression as a result of these low prices. The reduction was attributed by unthinking people to all sorts of extraneous causes, financial and political, and the great crop was divided up theoretically into daily individual rations to show how small an allowance it really was. While grumbling over the unremunerative prices, the untoward meteorology of 1890 was silently and surely working a cure for low prices. A glance at that statement of prices is a wonderful revelation of sudden advance. The average of Ohio jumps from 31 to 51 cents; Indiana, from 27 to 47; Illinois, from 24 to 43; Iowa, from 19 to 41; Missouri, from 23 to 44; Kansas, from 18 to 51; Nebraska, from 17 to 48. Never before was the price so high in Nebraska since the State was self-supporting. In Iowa, Missouri, and Kansas, only in 1881 were prices higher, and in Ohio, Indiana, and Illinois only in 1881 and 1882. So radical a change is not desirable, because the production in large districts beyond the Missouri is not sufficient for consumption, and only the best farmers there have any corn for sale; yet it is a harsh but irresistibly forcible illustration of the truth that prices still depend on the relation of supply and demand.

WHEAT PRICES.

The farm price of wheat has exceeded a dollar per bushel only one year in the past decade, and that was in 1881, the year of low yield so well remembered by all our farmers. A sharp fall occurred in 1884, a year of large production in this country, in Europe, and in India. In six years, from 1884, low prices have prevailed except in 1888, in which the product dropped heavily. Relatively the December value of the present crop was higher than that of 1887, and 9.3 cents higher than that of 1884. The present quotations of wheat are nearly up to the highest records of the past six years. There is nothing very depressing in current wheat values. The gradual reduction of stocks of old wheat, visible and invisible, promises continuance of higher prices. Prospects of larger products, good yields in other countries, would tend to hold at present rates or reduce somewhat the quotations of the future. Thus is the wheat grower's profit dependent on the friendly alliance of rust, blight, and insect depredations in other fields.

The States this side of the Rocky Mountains which cut a figure in the commercial distribution of wheat are found in the following table of average farm prices on the 1st of December of each year. The time includes the period of crop failure in Western Europe 1876 to 1879, inclusive, which is responsible for the heavy exportation and high prices of this period. The high price in 1881 was due to a crop "failure" in this country. This period was the one in which our wheat acreage was so greatly enlarged. Since 1884 prices have been comparatively uniform, not to say uniformly low. The causes controlling these prices are as plainly visible as the bright side of the morning sun, and the local differences indicated in the table are as plainly visible. Even the low ebb of last year's average for Kansas and Nebraska is explained by abundance of home consumption, distance from market, lack of facilities for handling and export, surplus, and comparative lack of high favor for milling purposes which operates so generally in Dakota and Minnesota.

The following table affords opportunity for study of local conditions and their changes:

Average farm price of wheat for the years 1877 to 1890.

States.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>	<i>Cts.</i>
Ohio.....	124	82	130	102	129	95	99	75	91	74	73	97	97	97
Michigan.....	122	85	117	97	125	90	96	74	84	73	74	98	98	98
Indiana.....	113	81	117	99	127	99	95	67	86	70	72	94	94	94
Illinois.....	104	75	107	95	123	86	92	63	81	69	70	93	93	93
Wisconsin.....	98	67	104	100	119	80	88	60	76	66	64	96	96	96
Minnesota.....	91	51	94	87	108	82	80	50	70	61	59	92	92	92
Iowa.....	87	50	92	82	106	79	80	55	67	60	61	95	95	95
Missouri.....	100	67	101	89	119	85	86	62	77	63	62	93	93	93
Kansas.....	82	50	89	79	105	67	76	45	65	59	61	93	93	93
Nebraska.....	83	49	64	73	97	67	70	42	57	47	53	87	87	87
Dakota.....	.....	.....	.....	.....	.....	80	72	46	63	52	52	91	91	91
United States	108.2	77.7	110.8	95.1	110.5	89.2	91	64.5	77.1	68.7	66.1	92.6	92.6	92.6

A record of Chicago Board of Trade prices on the 1st of January since 1860, which are herewith given, shows that the lowest price in thirty years was in 1862, when the quotation was 76.5 cents. The premium on gold made abnormal currency values for a dozen years and more, and caused a difference in price more apparent than the average of these January prices, by decades, is 128.6 cents per bushel in the first, 110.5 in the second, and 90.7 cents in the third. The difference in gold values is slight between these decade averages. Still there are annual fluctuations, caused by fluctuating supply in the world, in which our surplus exercises a large, if not controlling influence. For instance, since 1880 the range of quotations has been from 126.8 cents in 1882, to 75 cents in 1885. Only three years ago we made the change from the highest to the lowest. So the lowest of January record in ten years was not in 1890, when the price was 78 cents, but five years ago. Last January's price was a little higher than that of 1885, but 22 cents lower than in 1889, and the only year that dollar wheat was then marketed was the fact of a poor crop a little better than that of 1881, which sent the January price (1881) 126.8 cents.

If wheat growers should insist on growing 600,000,000 bushels and at the same time demand a dollar per bushel, under existing conditions elsewhere, no exercise of power by the Government

possibly guaranty such a market price, or prevent its reaching a lower depth than it has hitherto reached.

CHICAGO PRICES OF CEREALS.

The following table gives the Chicago prices of cereals from 1861 to 1890, inclusive, as reported by the Board of Trade on or about the 1st of January of each year.

[Prices given in cents per bushel.]

Years.	Corn.	Wheat.	Oats.	Rye.	Barley.
1861.....	28 to 26½	82 to 83	17 to 17½	45½ to 46	88 to 43
1862.....	28	78	18	32	35
1863.....	42	115	43	60	85
1864.....	47½	126	66	102½	121
1865.....	88	176	64½	112	125
1866.....	45	122½	181	49	55
1867.....	74½	193	41	42½	
1868.....	86	193	55	56½	
1869.....	56	114	45½	47	114 119
1870.....	69	72	39½	40	162 108
1871.....	43½	109	39	30½	75 76
1872.....	40½	120½	31½	32½	63½ 67½
1873.....	30½	119	24½	24½	66 68
1874.....	53½	117½	38½	38½	76½ 78
1875.....	66	90½	52½	53	95 96
1876.....	43	95	29½	30½	66 67
1877.....	42½	124½	33½	34½	72 72½
1878.....	42½	107½	24½	24½	56 56½
1879.....	29½	81	19½	19½	48 48½
1880.....	39½	130	35	35½	80½ 80½
1881.....	36	95½	30½	31½	85 88
1882.....	60½	125½	43½	45	95½ 96
1883.....	40½	93½	25	25½	57 58
1884.....	54½	95½	33½	33½	58½ 59
1885.....	34½	72½	25½	25½	53 53
1886.....	36½	84½	28	28	55½ 56
1887.....	35	78	26½	26½	53 53
1888.....	48	77	31	31	62 62
1889.....	33½	99½	25½	25½	50 50
1890.....	29½	77½	10½	10½	44½ 44½

The following record of California prices of wheat (given for cents, but reduced to bushels of 60 pounds) was made by Albert Montpelier, manager of the Granger's Bank, San Francisco:

Years.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
1877-'78.....	136	134	139	140	138	142	134	122	117	119	115	101
1878-'79.....	100	102	104	103	102	102	101	101	99	97	98	99
1879-'80.....	101	101	105	118	122	122	117	115	116	102	95	92
1880-'81.....	90	87	80	87	91	87	82	79	80	82	83	83
1881-'82.....	82	92	100	101	103	99	99	98	98	97	100	101
1882-'83.....	102	101	99	99	100	101	106	114	116	106	105	98
1883-'84.....	93	101	102	101	109	110	105	97	95	92	91	87
1884-'85.....	83	79	72	75	75	76	78	77	77	84	86	84
1885-'86.....	85	85	85	89	84	83	81	77	78	81	79	77
1886-'87.....	78	78	80	81	83	89	94	90	94	103	107	119
1887-'88.....	113	75	77	80	83	82	80	79	79	84	84	79
1888-'89.....	81	89	91	96	95	87	84	85	83	83	79	77
1889-'90.....	79	79	77	78	78	77	77	76	77	77	79	77

The very high prices of 1887, 36 cents higher in July than in July of 1878, followed a crop a fraction above 10 bushels per acre for the Ab 90—67

whole country. It is seen that the averages for 1888-'89 were high as those of the period 1886-'87 and 1887-'88 and higher than 1885-'86.

The recent increase in prices.

Markets and Items.	Unit of measure.	1889.		1890.		1891.
		January 2.	July 1.	January 2.	July 1.	
Portland, Me.:						
Corn	Bushel	\$0.37 to \$0.50	\$0.50	\$0.50 to \$0.51	\$0.50 to \$0.45	\$0.45
Oats	do	.40	.42	.40 to \$0.42	.34	.35
Potatoes	do	.50	.60	.55	.70	.75
Hay, lucerne	Ton	12.00	15.00	14.00	17.00	12.00
Butter, creamery	Pound	.18	.22	.23	.25	.21
Cheese, sage	do	.14	.15	.14	.12	.13
Eggs	Dozen	.27	.30	.18	.25	.18
Lard, hog	Pound	.09	.10	.07	.06	.07
Wool, fleece-washed	do	.25	.28	.25	.28	.25
Boston, Mass.:						
Corn, No. 2 mixed	Bushel	.45	.45	.41	.41	.44
Oats, No. 2 white	do	.35	.35	.32	.32	.37
Rye	do	.67	.10			
Barley, 2-rowed	do	.80				
Potatoes, Boston	do			.55	.58	.72
Hebronia	do	.65	.60			
Hay, fair to good	Ton	10.50	17.50	17.00	15.00	15.00
Butter, extra	Pound	.25	.27	.18	.22	.13
Cheese, Vermont	do	.11	.12	.08	.08	.07
Eggs, Eastern extra	Dozen	.23	.24	.17	.20	.18
Lard, city rendered	Pound	.09	.09	.07	.07	.06
New York:						
Wheat, No. 2 winter	Bushel	1.02	1.04	.87	.87	.92
Corn, No. 2 mixed	do	.47	.48	.42	.40	.41
Oats, No. 2 mixed	do	.30	.31	.24	.24	.24
Rye, State	do	.60	.64	.52	.56	.56
Barley, 2-rowed	do	.75	.80		.51	.53
Pork, prime mess	Barrel	14.25	14.50	12.25	13.50	10.50
Butter, State dairy	Pound	.27	.28	.17	.21	.22
Cheese, State	do	.12	.12	.09	.10	.08
Eggs	Dozen	.20	.21	.14	.13	.12
Hay	100 lbs	.90	.95	.90	.85	.85
Tobacco, Connecticut leaf	Pound	.10	.10	.15	.15	.15
Tobacco, Virginia wrapper	do	.12	.15	.12	.12	.12
Philadelphia, Pa.:						
Wheat, winter	Bushel	.97	.98	.85	.81	.81
Corn, No. 2 mixed	do	.42	.42	.43	.36	.37
Oats, No. 2 white	do	.34	.34	.32	.30	.30
Hay, timothy	Ton	14.00	17.00	17.00	15.00	10.00
Baltimore, Md.:						
Wheat, No. 2 red, winter	Bushel	.95	.95	.79	.80	.80
Corn, mixed	do	.42	.41	.36	.31	.31
Oats, No. 2 white	do	.33	.34	.31	.30	.30
Rye, No. 2	do	.58	.49	.50	.57	.55
Hay, timothy	Ton	16.00	17.00	15.00	15.50	11.00
Wool, tub-washed, fair to choice	Pound	.32	.33	.28	.34	.33
Atlanta, Ga.:						
Wheat, winter	Bushel	1.12			.75	
Corn, white	do	.58	.56	.52	.52	.57
Oats, No. 2 mixed	do	.40	.38	.33	.34	.40
Potatoes	Barrel	2.25	3.00	1.50		2.00
Hay	Owt	1.05	.95	1.05	.90	.90
Beef, dressed	Pound	.05	.05	.06	.06	.06
Cotton	do	.09	.10	.09	.09	.11
Eggs	Dozen		.12	.14	.22	.12
New Orleans, La.:						
Corn, No. 2 white	Bushel	.46	.47	.48	.40	.47
Oats, No. 2	do	.35	.33	.33	.30	.37
Hay, prime	Ton	10.50	17.50	14.00	15.00	14.50
Pork	Barrel	14.25	13.00	13.25	10.37	12.75

The recent increase in prices—Continued.

Markets and Items.	Unit of measure.	1889.		1890.		1891.	
		January 2.	July 1.	January 2.	July 1.	January 2.	July 1.
Cincinnati, Ohio:							
Wheat, No. 2 red, winter	Bushel	\$0.93 to \$0.97	\$0.88 to \$0.90	\$0.76 to \$0.78	\$0.85 to \$0.87	\$0.95 to \$0.97	
Corn, No. 2 mixed	do	.34 .35	.36 .39	.30 .31	.37 .38	.52 .53	
Oats, No. 2 mixed	do	.27 .27	.25 .25	.23 .24		.43 .44	
Rye, No. 2	do	.56 .57	.44 .46	.46 .48	.50	.73 .74	
Potatoes	do	.30 .40	.25 .30	.30 .35	.40 .50	.95 1.00	
Hay, timothy	Ton	13.50 14.00	11.50 12.00	10.00 11.00	9.00 10.00	9.00 9.50	
Pork, mess	Barrel	13.50 13.62	12.12 12.25	9.50	13.00 13.75	10.00 10.12	
Butter, fancy creamery	Pound	.35	.18 .20	.20 .30	.18	.30 .31	
Cheese, Ohio factory	do	.11 .11	.07 .08	.00 .09	.07 .08	.09 .09	
Eggs	Dozen		.11 .11	.15	.10	.20	
Chicago, Ill.:							
Wheat, No. 2 red, winter	Bushel	.99 1.01	.82 .64	.77 .78	.85 .88	.88 .89	
Corn, No. 2	do	.33 .33	.35 .35	.29 .29	.33 .34	.48 .49	
Oats, No. 2	do	.25 .25	.22 .22	.20 .20	.27	.42 .42	
Rye, No. 2	do	.50	.43 .43	.44			
Hay, No. 1 timothy	Ton	11.00 11.50	10.00 11.00	9.00 10.50	10.00 11.50	9.00 9.75	
Beef, extra mess	Barrel	6.00 6.25	6.25 6.50	5.75 6.00	6.00 6.25	5.50 5.75	
Pork, mess	do	12.55 12.57	11.70 11.75	9.10 9.12	11.25 12.00	10.30 10.25	
Eggs	Dozen		.12	.16 .17	.19	.22	
Milwaukee, Wis.:							
Wheat, No. 2 spring	Bushel	.95	.78 .78	.72 .73	.83	.83 .83	
Corn, No. 2	do	.31	.35 .35	.28 .28	.35 .35	.47 .48	
Oats, No. 2 white	do	.27 .28	.27 .27	.22 .22	.30	.42 .43	
Barley, No. 2	do	.67	.50 .50	.47 .47	.48	.66 .67	
Rye, No. 1	do	.40 .50	.43 .43	.45 .45	.48	.67	
Potatoes	do	.30 .35	.25 .35	.30 .40	.40 .65	.75 1.00	
Hay, timothy	Ton	9.00 11.00	10.00 11.00	7.00 9.00	8.00 9.00	8.00 8.50	
Pork, mess	Barrel	12.80	11.65	9.75	11.00	10.25	
Beef, extra mess	do	6.75		6.50	6.50	6.25	
Butter, creamery	Pound	.22 .27	.15 .16	.21 .23	.14 .14	.23 .25	
Cheese, Wisconsin	do	.09 .12	.07 .08	.09 .11	.07 .08	.09 .10	
Wool, washed	do	.28 .33	.26 .28	.25 .33	.25 .31	.25 .30	
St. Louis, Mo.:							
Wheat, No. 2 red, winter	Bushel	.95 .05	.84 .81	.78 .25	.85 .33	.90 .47	
Corn, No. 2	do	.30 .30	.31 .22	.23 .19	.33 .28	.42 .42	
Oats, No. 2	do	.24 .42	.40 .42	.42 .45	.45	.64 .63	
Rye, No. 2	do	.47 .48					
Potatoes, choice	do	.40 .42	.42 .42	.40 .45	.80 .90	.95 1.10	
Hay, timothy	Ton	13.25 16.00	12.00 10.00	12.00 8.50	14.50 8.50	12.00 10.00	
Beef, family	Barrel	8.50 10.00	8.50 10.00	8.50 10.00	8.50 10.00		
Pork, mess	do	13.75 14.25	12.25	9.50	11.50	10.37 10.50	
Lard, prime	do						
steam	Pound	.07 .10	.06 .10	.05 .14	.06 .06	.06 .18	
Eggs	Dozen		.10	.14	.08	.18	
Tobacco, Missouri:							
Burley	100 lbs	4.00 7.00	5.00 6.50	5.00 6.00	4.00 6.50	5.00 6.50	
Wool, tub-washed, fair	do	.85 .96	.94 .95	.92 .93	.92 .93	.90 .92	
San Francisco, Cal.:							
Wheat, No. 1 white	Cental	1.42	1.30	1.20	1.31	1.35	
Barley, No. 2 brewing	do	.88		.92		1.52 1.55	
Oats, No. 2	do	1.06	.90	1.17 1.20	1.52 1.55	1.82 1.85	
Corn, No. 1 white	do	1.07	1.12	1.08 1.00	1.00 1.03	1.32 1.35	
Rye, No. 1	do	1.85	1.05	1.00 .92	.92	1.82 1.35	
Potatoes	do	.45	.75	1.55 1.60	1.25 .90	.90 1.15	
Hay, No. 1 oats	Ton	12.50	10.00	9.00 11.00	9.00 12.00	13.00 14.50	
Butter, good to choice	Pound	.27 .15	.17	.17 .30	.13 .14	.32 .36	
Cheese	do	.10 .14	.06 .07	.08 .12	.06 .06	.11 .16	
Eggs, choice	Dozen		.30	.35 .42	.30 .22	.30 .32	
Wool, Oregon Valley	Pound	.20 .22	.21 .21	.19 .20	.18 .21	.20 .22	

An examination of this table shows extraordinary advance in, especially in corn and oats, since January of last year. In corn increase amounts to about 66 per cent in Chicago, 70 in Milwaukee and Cincinnati, 88 in St. Louis, and 62 in New York. No. 1 Chicago advanced from 29½ and 29½ to 43½ and 43½; and in New York from 40½ and 40½ to 61½. The Chicago price of oats more than doubled, advancing from 20½ to 42½. There was much less advance in the rates for wheat, the advance being from 78 to 83 in Chicago, and from 78 to 93 in St. Louis. These prices are probably an effective antidote for depression.

COTTON PRODUCTION AND TRADE OF THE WORLD.

The cotton plant can be grown in various sections of the globe lying within the parallels of 35° of latitude north and south, and this belt is contained the largest portion of the land surface of the globe. It is cultivated to a greater or less extent by almost all the people inhabiting this portion of the earth's surface, though the districts between 20° and 35° north latitude seem now best adapted to its profitable culture. Within these lines lie the cotton districts of the United States, Northern Mexico, Egypt, Northern Africa, and Asia, except the extreme southern portions of India and the Malay peninsula. South of the equator it is grown in Brazil, where practically almost the whole Empire may be said to be suitable for cotton culture; in Australia, though its cultivation has never been successfully carried on to any extent, and in Africa, where the extent of its growth and its consumption as yet are mere matters for conjecture and speculation. In fact, the area on which cotton of any kind may be produced is practically limited only by the requirements for the product. It is the fiber which is adapted for use under the widest conditions of climate and civilization, and it is the only yet known which is and can be produced in such quantities and so cheaply that the permanent demand can not possibly exceed the supply.

PRODUCTION OF THE WORLD.

It is less than seventy years since the first attempt was made to make an accurate record of the annual production of cotton in this country, and accurate statistics for other civilized countries where cotton is a staple is grown, are only available for a much more recent period. A large proportion of the fiber entering into civilized commerce, and especially that grown in the United States, is produced in countries of semi-civilization, and of this product there is no accurate record. Its aggregate can only be approximated from the amount entering the channels of foreign trade, supplemented by the probable requirements for domestic consumption. To render still more complicated the task of compiling a statement of the world's aggregate production there are countries and districts where it is largely grown and for which absolute data are available. The extent of its cultivation in China is a secret, though the suitability of its soil and the character of the clothing of the population of the Empire make it certain that the production of the country is very considerable. Even in India the side of the British districts, statements of production are only approximations based largely upon the amount coming into sight of the known requirements of the natives for dress.

The interior of Africa is a vast unknown continent, but the extent of territory capable of growing cotton must be very great. The population of this dark quarter of the globe is a matter of the im-

conjecture, and while the decrees of fashion demand but scanty clothing, it is known that in all sections of the vast territory yet visited cotton fabrics largely compose the native clothing. It is scanty, but in the aggregate must absorb a large annual production of the fiber. The greater part of the crop of the world is grown by colored labor, and our Southern States may yet find their competitor for the world's market in their own class of labor at work under the tropical skies of its native home.

When the difficulties in the way of procuring a reliable estimate of the world's product, in this present age of progress and statistical information, are considered, it will be seen how little reliable are statements of that product fifty and one hundred years ago. The increase in production since the introduction of the saw gin has been enormous, but has been largely confined to the new world. The primitive methods of a century ago are still mainly followed in Asia and Africa, and if the aggregate product of those continents has increased at all, it has been probably only in proportion to population. It is a question whether in the aggregate the last century has not witnessed a decline, on account of the introduction into these lands of cheap manufactured goods. The competition between the new and the old systems of production, between improved implements and machinery and hand power, can have but one result, though the element of cheap labor may support the primitive methods for a time.

Among the earliest and most pretentious estimates of the world's production are those put forth in a letter from Levi Woodbury, Secretary of the Treasury, to James K. Polk, Speaker of the House of Representatives, dated February 29, 1836, and in response to a resolution of the House. The report accompanying gives evidence of a very careful and thorough study of the entire subject. The estimates are evidently based upon the most reliable data to be obtained, and are doubtless as nearly correct as any statement of the product of the world at the dates given could be made.

These estimates, in pounds, are as follows:

	1791.	1801.	1811.	1821.	1831.	1834.
United States	2,000,000	48,000,000	80,000,000	180,000,000	385,000,000	460,000,000
Brazil	22,000,000	36,000,000	35,000,000	32,000,000	38,000,000	30,000,000
West Indies	12,000,000	10,000,000	12,000,000	10,000,000	9,000,000	8,000,000
Egypt			83,333	6,000,000	18,000,000	25,000,000
Rest of Africa	46,000,000	45,000,000	44,000,000	40,000,000	36,000,000	34,000,000
India	130,000,000	160,000,000	170,000,000	173,000,000	180,000,000	185,000,000
Rest of Asia	190,000,000	160,000,000	146,000,000	135,000,000	115,000,000	110,000,000
Mexico and South America, except Brazil	68,000,000	56,000,000	57,000,000	44,000,000	35,000,000	35,000,000
Elsewhere		15,000,000	11,000,000	8,000,000	4,000,000	13,000,000
The world	490,000,000	530,000,000	555,083,333	630,000,000	820,000,000	900,000,000

NOTE.—The error in the footings of the first two columns is made in the original document.

The first of these estimates is for a year prior to the invention of the gin, and illustrates admirably the distribution of the industry at the close of the first period in the history of cotton growing. The year for which the estimate is made, 1791, is almost the last year in which cotton was raised and laboriously cleaned by hand labor for spinning by the primitive methods in vogue before steam power was successfully applied. At that date the United States was practically unconsidered in cotton production, its crop being only about 10 per

cent of that of Brazil, and ranking lowest of all countries in which it was grown. During the succeeding decade the invention of the gin and the revolution of methods which marked the beginning of the present era of the industry, stimulated the culture of the plant in this country, making it one of our agricultural staples. During the ten years the production of this country increased from 2,000,000 to 48,000,000 pounds, making the United States rank as fourth in the world in countries of production.

Between 1811 and 1821 this country attained its present position as the principal cotton-growing country of the world, and by 1834 grew more than one half of the aggregate product of the world.

Beginning with 1837, there is a record of the commercial movement of the crop each year in the United States which practically covers the entire production. This actual record, with the estimates of Secretary Woodbury, makes it possible to present the following statement showing our production in periods ten years apart since 1791.

Year.	Pounds.	Year.	Pounds.
1791.....	2,000,000	1861.....	7,427,471
1801.....	48,000,000	1870.....	1,334,000
1811.....	80,000,000	1871.....	1,394,000
1821.....	180,000,000	1881.....	3,500,000
1831.....	444,394,020	1882.....	3,622,827
1841.....	739,903,750		

In preparing a statement of the aggregate production of the world at the present time, except in the case of the United States, no limited data are obtainable showing the actual product of any country, the estimates being necessarily based upon the known facts of exportation, population, and assumed consumption per head of each. Mr. Thomas Ellison, of Liverpool, after a most careful and painstaking investigation, makes a statement of the world's production at about the date of 1884, which as a whole can hardly be improved upon at present.

This statement is as follows, in bales of 400 pounds:

Country.	Bales.	Per Cent.
United States of America.....	7,037,000	
South America, West Indies, etc.....	341,000	
East Indies.....	2,450,000	
China.....	1,427,000	
Japan.....	132,000	
Turkey and Persia.....	120,000	
Asiatic Russia.....	100,000	
Egypt.....	625,000	
Africa (except Egypt).....	222,000	
Italy and Greece.....	10,000	
Australia, Fiji, etc.....	2,000	
Total for the world.....	12,574,000	

Since the date of this estimate the crop of the United States has been materially enlarged, and instead of 2,814,000,000 pounds, as credited above, our production for 1889 amounted to 3,622,827,694 pounds.

The United States now consumes in its cotton manufactures between 30 and 33½ per cent of its annual production of the fiber, and the proportion is slowly but steadily increasing. Prior to 1840 more than three fourths of our production was consumed in foreign markets.

but our manufacturing interests have increased by a little more rapid ratio than our production. The following table presents in condensed form the average annual production and exportation, by decades, from 1841 to 1889:

Period.	Production.	Exportation.	Per cent exported.
	<i>Pounds.</i>	<i>Pounds.</i>	
1841-'50	1,018,706,815	789,183,696	72.0
1851-'60	1,656,247,661	1,118,106,790	67.5
1861-'70	1,297,745,908	860,437,430	66.3
1871-'80	2,183,174,113	1,493,829,264	68.4
1881-'89	3,144,437,868	2,125,612,794	67.6

With the exception of the period from 1871 to 1880 the proportion exported during each succeeding decade has declined. This break in the decline is due to the fact that production under the stimulus of free labor temporarily outran the increased capacity of our mills, but during the nine years since the demand has again adjusted itself to the enlarged supply, and the proportion of the crop seeking foreign markets again continues to grow smaller.

An interesting comparison of the average consumption of domestic mills in each section of the country since the war, in periods of six years, is presented. The figures represent actual consumption in bales of 400 pounds each:

Periods.	North.	South.	Total.
	<i>Bales.</i>	<i>Bales.</i>	<i>Bales.</i>
1866-'67 to 1871-'72	939,000	94,000	1,033,000
1872-'73 to 1877-'78	1,324,000	157,000	1,481,000
1878-'79 to 1883-'84	1,845,000	273,000	2,117,000
1884-'85 to 1889-'90	1,955,323	470,687	2,426,000

The figures of the last period are eloquent of the progress of the "New South." That section shows an increased mill consumption of more than 77 per cent over the preceding period, while the mills of the North during the same period increased their capacity only 6 per cent.

TRADE OF THE WORLD.

Cotton manufacture is carried on, to some extent, at least, in every country where the fiber is grown, though outside of Europe and the United States it is generally crude and by the most primitive methods. These countries weave the greater part of the cloth consumed in the world, and the fiber, in its raw and manufactured state, forms one of the most important items of their commerce.

The United Kingdom, by reason of its peculiar position and advantages, with its commercial supremacy, is the leading manufacturing nation. Her limited area, teeming population, and insular location make her naturally a manufacturing country, and this branch of industry was early developed and its improvements jealously guarded. Until within a year or two that country consumed more raw cotton in its domestic manufactures than the whole continent of Europe, but the continental countries are rapidly increasing the capacity of their mills and now demand the larger supply. The an-

nual average trade of Europe in raw cotton for a period of ten years is thus presented:

Countries	Period.	Imports.	Exports.	Net
		<i>Pounds.</i>	<i>Pounds.</i>	
Austria-Hungary.....	1877-'80	176,535,856	18,131,526	
Belgium.....	1877-'80	48,522,982		
Denmark.....	1877-'80	581,440	911,031	
France.....	1877-'80	300,153,424	40,547,876	
Germany.....	1877-'80	370,518,480	56,774,384	
Great Britain and Ireland.....	1877-'80	1,508,121,771	216,522,562	1,291,599,209
Italy.....	1877-'80	116,150,074	32,129,839	
Netherlands.....	1877-'80	82,028,976	64,398,969	
Norway.....	1877-'80	6,849,450		
Portugal.....	1877-'80	7,030,969		
Russia in Europe.....	1877-'80	328,451,473		
Spain.....	1877-'80	97,988,297		
Sweden.....	1877-'80	21,229,473		
Switzerland.....	1877-'80	50,373,236		
Total.....		3,103,428,421	406,639,082	2,696,789,339

The receipts of Great Britain and Ireland were more than of all other countries. Germany, Russia, France, and Spain in order. This country is only exceeded in cotton manufactures by the United Kingdom, and should, ere many decades pass, attain the first rank.

According to the reliable records of Ellison & Co., of Liverpool, the United Kingdom now consumes about 37 per cent of the cotton of the world which enters the channels of civilized commerce, the rest of Europe 38 per cent, and the United States 25 per cent. Fifty years ago, or during the period from 1841 to 1845, the proportions were materially different. Then the United Kingdom used 55 per cent of the supply, the continent 30 per cent, and the United States only 15 per cent. This cotton is supplied by America, Brazil, East and West Indies, Egypt, etc., this country now furnishing 77 per cent. of the whole against 86 per cent fifty years ago. The cause of this slight decline in the proportion has been the increase in the shipments from India, a trade stimulated to the utmost possible extent by English interests.

The following tables present in very condensed form the average annual consumption and supply in different five-year periods from 1841:

CONSUMPTION.

Periods.*	Great Britain.	Continent.	U. S.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
1841-'45.....	521,300,000	267,200,000	174,000,000
1851-'55.....	750,100,000	451,400,000	250,000,000
1861-'65.....	638,000,000	455,400,000	250,000,000
1871-'75.....	1,228,000,000	856,600,000	520,000,000
1881-'85.....	1,441,100,000	1,314,300,000	650,000,000
1891-'95.....	1,508,700,000	1,510,100,000	650,000,000

SUPPLY.

Periods.	America.	Brazil.	West Indies.	East Indies.	Other.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
1841-'45.....	816,300,000	18,900,000	9,400,000	72,600,000	10,000,000
1851-'55.....	1,254,700,000	27,100,000	6,300,000	154,800,000	10,000,000
1861-'65.....	531,700,000	36,200,000	14,000,000	491,300,000	10,000,000
1871-'75.....	1,682,300,000	108,800,000	42,800,000	528,500,000	10,000,000
1881-'85.....	2,717,300,000	54,100,000	11,000,000	540,300,000	10,000,000
1891-'95.....	3,095,400,000	55,500,000	13,300,000	552,400,000	10,000,000

The export trade of countries which lack even and systematic development of all resources and industries is largely made up of raw agricultural products. The foreign trade of the United States is made up to the extent of some 73 per cent of farm products, and raw cotton constitutes about one third of the aggregate value, but the proportion of cotton and of all agricultural products is declining. As our population becomes denser, and our industries more diversified, we shall send abroad a smaller proportion of fiber and more manufactured goods, retaining for our own people both the profit in growing and spinning. At present, with the steady development of our manufactures which has taken place, we purchase cotton goods abroad, buying in 1890 nearly \$30,000,000 worth, while we exported only \$10,000,000.

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STATISTICAL GRAPHICS.

An Album of Agricultural Statistics has been issued during the past year to farmers' institutes, agricultural colleges, libraries, schools, boards of agriculture, and other organizations or individuals. The edition was limited to 10,000, and was therefore distributed with reference to use and practical utility. It is now nearly exhausted.

It consisted of sixteen maps of the United States each, representing a distinct topic, as follows :

- I. Percentage of unoccupied and of farm lands, comprising the superficial area of each State.
- II. Percentage of each grand division of farm area in each State.
- III. Acreage in corn, per 1,000 acres of superficial area, in each State.
- IV. Acreage in wheat, per 1,000 acres of superficial area, in each State.
- V. Acreage in oats, per 1,000 acres of superficial area, in each State.
- VI. Yield of corn per acre in each State.
- VII. Yield of wheat per acre in each State.
- VIII. Yield of oats per acre in each State.
- IX. Average value of horses in each State.
- X. Average value of cattle (exclusive of milch cows) in each State.
- XI. Average value of milch cows in each State.
- XII. Average value of sheep in each State.
- XIII. Average value of swine in each State.
- XIV. Rural population of the United States as a percentage of the total population by States.
- XV. Average value of lands in the United States.
- XVI. Farm tenures in the United States.

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IMPORTS AND EXPORTS OF AGRICULTURAL PRODUCTS.

The official records of foreign trade for the fiscal year 1890 show an increase in the total exports from this country over last year of \$115,011,219, changing the balance of trade, which was against us in 1889, by \$14,849,043, to one in our favor of \$55,983,419. The importance of the farmer in our foreign commerce is emphasized by the fact that the product of his labor last year furnished 74.2 per cent. of our total shipment abroad, while 47.4 per cent. of our imports were of agricultural products. During 1889 the balance in favor of our farmers in this international exchange of farm products amounted to \$174,000,000, but the transactions of 1890 leave a still more gratifying balance on the credit side of the ledger amounting to \$253,000,000. This at least is the apparent balance, though the real difference is much less, for the value of exports includes transportation to seaboard.

and that of imports is increased by the cost of sea and land transportation from foreign countries.

The greater part of our increase in exports was made up of increase in agricultural products, which amounted to \$97,000,000. This enlargement of the foreign market for our agricultural surplus was especially gratifying, coming at a period when our farmers were beginning to feel keenly the decline in agricultural values which was prevailing in all portions of the world. More than one half of the increased demand was for animals and their products, the sales of cattle alone amounting to \$15,000,000 more than in the previous year. Beef products contributed \$7,000,000 to the increase, while our pork products, though partially barred from some countries, showed a still more striking increase, amounting to \$20,000,000.

The shipments of breadstuffs showed an advance in value over the previous year of \$31,000,000, wheat contributing about one half. An encouraging feature of this branch of the trade was the increase of \$10,000,000 in shipments of corn and \$4,000,000 in oats.

The increase in agricultural imports was not in proportion to the total increase of imports, but aggregated \$18,000,000. Of this increase sugar furnished \$8,000,000, tea and coffee \$4,000,000, and tobacco \$7,000,000, while numerous other products show smaller gains. There was a marked falling off in value of hides, wool, and honey imported. As our agriculture becomes more diversified, and the range of successful cropping more extended, the balance of foreign exchange in favor of our agriculture will become more pronounced. Sugar is now the largest item purchased abroad, and our present activity and success in the line of beet, cane, and sorghum experiments indicates a speedy curtailment of the amounts paid each year for foreign sugars.

The following tables present in itemized form our foreign trade in agricultural products for two years past:

IMPORTS.

Articles.	1890.	1891.
Sugar and molasses:		
Sugar	\$98,543,971	\$98,694,000
Molasses	4,753,897	5,125,000
Sugar drainings	4,000	5,000
Total sugar and molasses	103,301,868	103,824,000
Tea, coffee, and cocoa:		
Tea	12,954,660	12,917,000
Coffee	74,794,992	79,287,000
Cocoa, crude, and leaves and shells of	2,162,161	2,375,000
Unenumerated items	337,730	500,000
Total tea, coffee, and cocoa	80,250,543	85,089,000
Animals and their products, except wool:		
Cattle	703,400	844,000
Horses	4,400,400	4,800,000
Sheep	1,200,000	1,300,000
All other and fowls	390,712	410,000
Histles	1,094,784	1,200,000
Butter	24,077	10,000
Cheese	1,130,184	1,000,000
Eggs	2,418,976	2,000,000
Glue	644,400	670,000
Grease	212,198	200,000
Hair	2,180,841	2,000,000
Hides	25,127,750	27,000,000
Hide cuttings, etc.	222,251	200,000
Horns, hoofs, etc.	243,970	200,000
Ments		
Preserved	220,411	200,000
All other	190,734	100,000

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IMPORTS—Continued.

Articles.	1889.	1890.
Milk, preserved or canned	\$35,485	\$98,893
Oil, animal	3,077	0,471
Sausage skins	377,750	494,958
Unenumerated items	203,278	490,648
Total animals and their products, except wool	42,263,014	89,861,472
Fibers:		
Animal—		
Wools	17,074,515	15,264,083
Silk, unmanufactured	19,833,230	24,821,867
Vegetable—		
Cotton	1,194,505	1,362,728
Flax	2,070,730	2,188,021
Hemp and all substitutes	9,433,774	7,341,956
Jute	2,853,664	3,949,926
Sisal grass and other vegetable substances	6,110,308	7,064,184
Fibers not elsewhere specified	483,212	697,680
Total fibers	59,453,936	61,530,445
Miscellaneous:		
Breadstuffs—		
Barley	7,723,888	5,629,849
Corn	1,216	908
Oats	10,173	8,950
Oatmeal	56,008	59,300
Rye	24	115,657
Wheat	119,017	112,303
Wheat flour	5,792	5,049
Breadstuffs and farinaceous substances not elsewhere specified	1,055,655	1,210,983
Chicory	216,573	209,283
Fruits and nuts	18,746,417	20,746,471
Hay	1,089,885	1,143,445
Hops	1,155,473	1,063,616
Indigo	2,664,105	1,827,937
Ivory, vegetable	96,574	61,477
Malt, barley	111,381	101,666
Oils, vegetable:		
Fixed or expressed—		
Olive	696,063	819,110
Other	1,108,854	1,340,551
Volatile or essential	1,183,005	1,061,681
Opium, crude	1,454,007	1,188,712
Plants, trees, and shrubs	335,331	343,226
Rice and rice meal	3,499,437	2,540,674
Seeds	5,077,223	4,069,814
Spices:		
Ground	173,668	249,077
Unground—		
Nutmegs	514,888	534,340
Pepper	1,578,431	1,619,215
All other	860,889	820,439
Tobacco, leaf	10,868,226	17,605,192
Vanilla beans	699,003	559,867
Vegetables:		
Beans and pease	786,343	1,307,702
Potatoes	321,100	1,365,898
Pickles and sauces	349,423	386,307
All other—		
In their natural state or in salt or brine	423,124	885,390
Prepared or preserved	389,804	510,077
Wines:		
Champagne and other sparkling	4,354,413	4,752,572
Still wines—		
In casks	2,126,548	2,450,174
In bottles	1,325,811	1,657,210
Unenumerated items	123,187	148,491
Total miscellaneous	71,254,894	78,577,563
RECAPITULATION.		
Sugar and molasses	93,301,894	101,267,326
Tea, coffee, and cocoa	89,859,822	98,454,637
Animals and their products, except wool	42,263,014	89,861,472
Fibers, animal and vegetable	59,453,936	61,530,445
Miscellaneous	71,254,894	78,577,563
Total agricultural imports	266,138,060	279,191,442
Total imports	745,181,652	789,310,409
Per cent of agricultural matter	47.8	47.4

EXPORTS.

Articles.	1899.		1900.
	Quantities.	Value.	Quantities.
Animals, living:			
Cattle..... number..	332,780	\$10,010,017	334,185
Hogs..... do.....	45,128	356,764	95,148
Horses..... do.....	3,748	592,469	3,501
Mules..... do.....	2,480	376,200	3,544
Poultry..... do.....	128,832	306,181	65,521
All other and fowls.....		98,141	
Animal matter:			
Bones, hoofs, horns and horn tips, strips and waste.....		342,429	
Casings for sausages.....		510,114	
Eggs..... dozen.....	546,760	75,595	580,984
Glair..... pounds.....	534,263	74,293	729,640
Grease, grease scraps, and all soap stock.....		637,870	
Hair and manufactures of.....		398,781	
Hides and skins other than furs.....		939,790	
Honey.....		92,883	
Oils.....			
Lard..... gallons.....	161,570	549,937	1,216,611
Other animal..... do.....	526,080	377,910	737,723
Meat products—			
Beef products—			
Beef, canned..... pounds.....	51,035,354	4,375,513	62,628,567
Beef, fresh..... do.....	137,800,391	11,481,901	173,287,590
Beef, salted or pickled..... do.....	55,000,309	3,043,324	97,508,419
Beef, other cured..... do.....	194,090	17,819	102,110
Tallow..... do.....	77,844,565	3,942,024	112,746,870
Mutton..... do.....	296,220	25,960	326,711
Oleomargarine—			
Imitation butter..... do.....	2,192,047	250,005	2,533,900
The oil..... do.....	23,102,534	2,664,402	68,378,000
Pork products—			
Bacon..... do.....	357,377,390	29,872,231	531,830,677
Hams..... do.....	42,847,247	4,770,616	76,591,279
Pork, fresh..... do.....	25,794	1,692	279,493
Pork, salted or cured..... do.....	64,110,845	4,733,415	72,789,423
Lard..... do.....	318,342,900	27,123,173	471,063,598
Poultry and game.....		8,827	
All other meat products.....		876,161	
Dairy products—			
Butter..... pounds.....	15,564,978	2,164,785	29,748,042
Cheese..... do.....	84,009,828	7,880,671	62,376,053
Milk.....		290,500	
Wax, bees'..... pounds.....	99,917	23,918	171,321
Wool, raw..... do.....	141,670	23,063	231,063
Total value of animals and animal matter.....			
		120,580,103	
Bread and breadstuffs:			
Barley..... bushels.....	1,440,321	823,400	1,646,371
Bread and biscuits..... pounds.....	14,494,880	749,632	15,235,540
Corn..... bushels.....	60,523,029	22,082,577	101,973,717
Cornmeal..... barrels.....	312,186	870,485	301,848
Oats..... bushels.....	624,226	345,502	13,692,776
Outmeal..... pounds.....	10,210,413	273,173	25,460,512
Rye..... bushels.....	267,253	154,917	2,257,577
Rye flour..... barrels.....	3,609	13,370	3,933
Wheat..... bushels.....	45,414,120	41,630,701	54,387,767
Wheat flour..... barrels.....	9,374,803	46,390,425	12,221,711
All other breadstuffs and preparations of, used as food.....		780,540	
Total value of bread and breadstuffs.....			
		123,576,601	
Cotton and cotton-seed oil:			
Cotton—			
Sea island..... pounds.....	6,439,669	1,301,405	9,990,819
Other manufactured..... do.....	2,778,367,100	286,228,775	2,462,679,694
Cotton-seed oil..... gallons.....	2,690,700	1,248,630	13,384,383
Total value of cotton and cotton-seed oil.....			
		290,073,870	

EXPORTS—Continued.

Articles.	1889.		1890.	
	Quantities.	Value.	Quantities.	Value.
Miscellaneous:				
Broom corn.....		\$152,542		\$111,147
Fruits and nuts—				
Apples, dried..... pounds..	22,102,579	1,201,070	20,861,462	1,038,682
Apples, green or ripe..... barrels..	942,406	2,240,375	425,506	1,231,436
Fruits, preserved—				
Canned.....		915,341		608,321
Other.....		52,048		59,401
All other, green, ripe, or dried.....		621,390		1,008,846
Nuts.....		32,460		27,861
Hay..... tons..	21,928	398,777	36,274	567,558
Hops..... pounds..	12,589,262	2,423,832	7,540,854	1,110,571
Oil-cake and oil-cake meal..... do.....	588,317,880	6,927,912	711,704,373	7,909,926
Oils—				
Linseed..... gallons..	72,451	42,759	89,288	55,086
Other vegetable.....		55,812		102,792
Rice..... pounds..	439,706	24,124	388,914	20,728
Seeds—				
Clover..... do.....	34,253,137	3,110,553	26,500,578	1,762,034
Cotton..... do.....	11,373,865	119,279	7,680,601	74,575
Flaxseed or linseed..... bushels..			14,678	19,792
Timothy..... pounds..	10,200,673	451,728	11,051,053	473,770
All other.....		192,914		307,717
Tobacco—				
Leaf..... pounds..	211,521,051	18,546,991	244,343,740	21,149,869
Stems and trimmings..... do.....	12,238,181	354,077	11,308,286	329,687
Vegetables—				
Onions..... bushels..	75,074	63,780	80,375	72,760
Peas and beans..... do.....	294,456	560,574	261,212	558,317
Potatoes..... do.....	471,935	816,224	406,618	299,698
Vegetables, canned.....		811,254		231,265
All other, including pickles.....		198,130		225,060
Wine—				
In bottles..... dozen..	7,311	33,000	7,361	32,350
Not in bottles..... gallons..	372,350	236,498	353,333	238,540
All other agricultural products.....		228,399		271,235
Total value of miscellaneous products.....		40,210,753		40,044,009
RECAPITULATION.				
Animals and animal matter.....		126,586,108		173,986,750
Bread and breadstuffs.....		123,876,661		154,925,927
Cotton and cotton-seed oil.....		239,073,879		256,259,970
Miscellaneous products.....		40,210,753		40,044,009
Total agricultural exports.....		529,747,396		627,216,656
Total exports.....		730,282,600		845,233,826
Per cent of agricultural matter.....		72.5		74.2

NOTE.—In this compilation of domestic agricultural exports sugar and molasses are not included because they are mainly re-exports of foreign production. The totals differ from those given by the Bureau of Statistics of the Treasury Department, they having included sugar and molasses, "ginseng and roots, herbs and barks not otherwise specified," and glucose, or grape sugar.

FOREIGN DISTRIBUTION OF CEREALS.

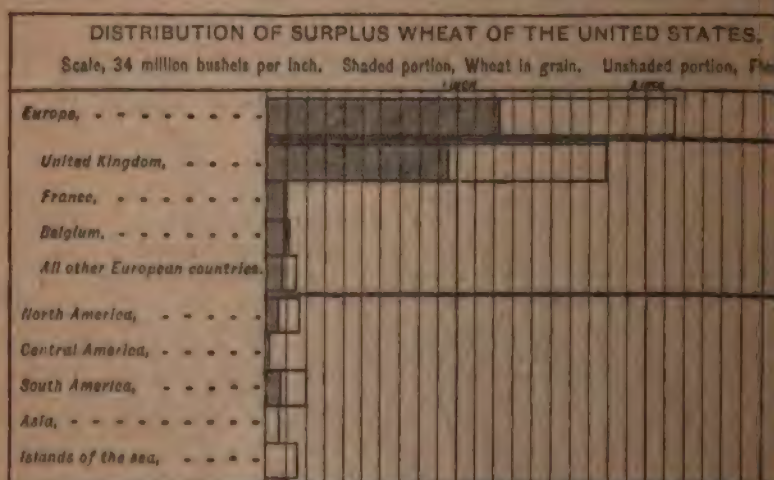
We have practically no surplus of cereals except wheat and corn. A large quantity of corn might be spared were there a foreign market for it. Wheat, in the form of grain and flour, is the principal cereal for the foreign trade. Where is it wanted? The record of the last fiscal year, 1889-'90, makes the foreign shipment of wheat unmanufactured 54,387,767 bushels, and of wheat in the form of flour 55,042,703 bushels, or a total of 109,430,470 bushels, which was 22.3 per cent of the estimated crop. Of this aggregate 78.2 per cent went direct to Europe; 5.7 per cent to Canada, most of which was ultimately added to the European supply. Central and South America took 8 per cent; the Islands of the Seas 5.6 per cent; and

the great continents of Asia, Africa, and Australasia only 2 cent, or 3,723,098 bushels, which includes our wheat supply these continents and nearly two thirds of the population of world. A single county of Dakota could supply from its soil this requirement, and in any good season each of five prairie counties could do it easily, viz. Brown, Cass, Grand Forks, Pennington and Walsh, and possibly each of several others, and yet all the counties of the two Dakotas are rushing forward in their search for more markets of more continents to conquer. It is an aim that has already seriously reduced the price of wheat of the United States.

The details of this distribution are presented by countries, as follows:

Countries.	Grain.	Flour as wheat.	Total wheat.	Grain.	Flour.
				Per cent.	Per cent.
Europe.....	40,043,570	35,516,511	55,050,981	44.2	33.4
United Kingdom.....	38,940,521	34,407,946	73,348,467	34.9	28.5
France.....	5,846,505	1,374	5,847,779	3.3	
Belgium.....	3,741,803	705,423	4,447,226	3.4	1.7
All other European countries.....	3,241,229	2,442,158	5,683,387	3.0	2.3
North America.....	2,235,041	3,916,787	6,151,828	2.1	3.6
Central America.....	55,215	810,419	865,634	.1	.7
South America.....	2,087,833	5,143,834	7,231,667	2.5	4.7
Asia.....	24	2,402,829	2,402,853		2.3
Africa.....	37,805	53,303	91,108		
Australasia.....	67,960	73,058	141,018	.1	.1
Islands of the Sea.....	173,788	5,935,577	6,109,365	.2	5.4
Grand total.....	54,987,767	55,042,705	110,030,472	49.8	30.2

To enforce the attention of the most casual reader to the magnitude of this unequal distribution and throw a strong light upon the tactical worthlessness of the world's markets for wheat, unless a deception be made of Liverpool, a diagram has been prepared which requires only a glance to make the subject clear as sunlight.



The exports of corn for the year ended June 30, 1890, and the principal countries receiving it, are as follows:

Countries to which exported.	Bushels.
Great Britain.....	54,657,196
France.....	8,431,699
Germany.....	11,419,063
Belgium.....	4,800,293
Denmark.....	5,788,733
Netherlands.....	3,367,823
All other European countries.....	1,091,745
Total to Europe.....	89,606,546
All other countries.....	13,812,163
Total.....	103,418,709

It is proper to observe that this is the largest quantity of corn ever exported in a single year; nearly all as grain, or 101,973,717 bushels, the remainder being corn meal, 361,248 barrels, reduced to grain on the basis of 4 bushels per barrel. More than half of the meal went to Canada.

The reason why last year's shipments were so large is solely the fact that the export price was the lowest known since 1850. The average was 41.8 cents per bushel. The next largest exportation was in 1879-'80, 99,572,329 bushels, when the export price was very low, or 54.3 cents per bushel. As might be expected, the smallest exportation in the last forty years was 1,392,116, exclusive of meal, when the price was 93 cents. There were two or three years between 1860 and 1870 when the price was higher in currency, but not in gold. The exportation of corn depends upon its price in this country, as set by the demands of home consumption. The latest illustration of this fact is seen in the exports of December, 1890, which amounted to 1,594,588 bushels, valued at 60.3 cents per bushel, while the exports of December, 1889, were 6,421,352, valued at 43.2 cents per bushel. The proportion of last year's exportation, taken outside of Europe, was only 13.4 per cent, almost exactly the proportion of the previous year's smaller shipments. Either McLean or Livingston County, Illinois, usually produces nearly as much as all the corn taken by the markets of the world outside of Europe in the year of most extensive exportation. As this country produces three fourths of all the corn of the world, and consumes more than twice as much as all other countries combined, it will require much missionary effort and experimental teaching in the preparation of a maize dietary to induce foreigners to make use of corn for food. It is only wanted now when very cheap, as a constituent in the feed rations of horses and cattle, and only to a very limited extent, by a few buyers in Western Europe. An increase in European requirements, from consumption as food, would benefit the consumer abroad far more than the producer in this country.

SUGAR PRODUCTION IN EUROPE.

The evolution of the beet-sugar manufacture is a growth of the present century. It was fostered early in the century by science and government through invention and bounty, yet half of its development has occurred during the last decade. Profiting by Euro-

pean experience, this country has a less difficult problem to solve. There have been no satisfactory experiments in the manufacture of sugar here until the success at Alameda in California. Those of Wisconsin, and Illinois were preliminary and inconclusive. The failures were necessarily failures from lack of skill and completeness of organization, and still more from failure of farmers to cooperate in the Maine case the average contracts were for only a fraction of an acre, a garden patch receiving ordinary field cultivation, without knowledge of the necessary culture or fertilization, without the adjunct of cattle-feeding and utilization of the by-product.

Now there promises to be a revival of the experiment since the repeated successes in California, with high promise of continued enlargement. Nebraska has already entered the lists. It was a craven and ignominious acknowledgment to admit that the manufacture can be carried on successfully throughout Europe and not be a success upon the continent of North America, when a yield of beets having a high content of sugar has been repeatedly grown from the Atlantic to the Pacific, and good sugar has been made year after year at a profit.

There are many intelligent citizens, even some newspaper editors who are entirely unaware of the fact that half the commercial production of the world is made of beet, on a continent where cane can be grown, and no other source of sugar is extensively available. They are especially oblivious of the fact that cane sugar is practically shut out of entrance into Europe, because the home product of beet sugar leaves no room for it. This general proposition has been vigorously maintained in the public press, though the facts show that for many years the continent of Europe, exclusive of the British Isles, has exported more than its imports. Indeed, few except those who are abreast of the statistical situation in sugar production are aware of the recent development of the industry. The past season, if Licht's estimate is reliable, the production (3,627,967 tons) is ample for the consumption of Great Britain and the continent together. The progress of beet-sugar manufacture in Europe in thirteen years, according to the authority quoted, is shown by the following figures of production, which are stated in metric tons.

Years.	Germany.	France.	Austria-Hungary.	Russia and Poland.	Belgium.	Holland and other countries.
1877-78.....	363,838	308,132	330,702	230,000	63,073	25,000
1878-79.....	430,086	432,634	406,906	215,000	69,367	30,000
1879-80.....	411,625	377,912	406,373	225,000	78,017	25,000
1880-81.....	594,228	333,614	398,032	350,000	69,636	30,000
1881-82.....	644,775	323,360	411,015	308,773	73,123	30,000
1882-83.....	848,134	423,194	473,000	354,391	82,735	30,000
1883-84.....	966,402	473,676	445,352	310,000	106,390	40,000
1884-85.....	1,155,000	528,409	527,500	386,400	89,450	30,000
1885-86.....	835,050	520,400	377,000	540,000	48,600	37,500
1886-87.....	950,010	520,000	525,000	475,000	60,000	50,000
1887-88.....	950,156	372,824	428,610	441,542	149,742	119,200
1888-89.....	900,604	466,707	523,342	506,397	143,804	153,040
1889-90.....	1,364,007	787,069	753,078	466,000	221,460	135,313

Germany produces about one third, heading the list of producing countries. Austria and France are large producers, and Russia more than doubled production in a dozen years. The average output of four years, prior to the campaign just closed, is 2,49

metric tons, or 5,498,131,306 pounds. A comparison of imports and exports shows that this product more than sufficed for the consumption of the continent. The net exports of recent years average nearly 1,500,000,000 pounds, making the consumption about 4,000,000,000 pounds annually. With increase of production and prevailing cheapness, however, consumption is doubtless now increasing materially. The rate of consumption differs greatly in the different countries, being very low in Russia and Italy, Spain and Portugal; much larger for France and Germany and Scandinavia, though these countries scarcely use a third as much as Great Britain.

For the purpose of closely approximating the annual consumption of sugar in Europe, and of determining how much, in recent years, is beet sugar and how much cane sugar, the customs records of 1886 to 1888, inclusive, have been searched, and imports and exports of each country ascertained and reduced to pounds from the original kilograms, hundred weights, poods, and other measures. An annual average of three years eliminates much of the effect of the annual fluctuation, and determines more closely the annual consumption, which is made up of the two elements—production and importation.

The following table shows, for the years indicated, the average annual imports of sugar into the countries named, with the average annual exports therefrom for the same periods respectively. It also shows the net imports or the net exports, as the case may be, for each country, with the general net imports for the whole of Europe.* The figures for Austria-Hungary, Germany, Roumania, and Switzerland include molasses, and to that extent overstate the sugar trade. All the figures are taken directly from the official documents of the respective countries with the exception of those for Russia and Switzerland, which are from the British "Statistical Abstract for the Principal and other Foreign Countries." The foreign denominations are here reduced to their equivalents in pounds:

Countries.	Years.	Annual average.			
		Imports.	Exports.	Net imports.	Net exports.
		<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Austria-Hungary.....	1886, 1887, and 1888.	2,382,964	515,840,906		513,477,942
Belgium.....	do.....	30,164,776	218,021,270		188,756,494
Denmark.....	do.....	41,477,300	5,284,461	36,192,838	
France.....	do.....	387,578,141	387,926,353	49,652,788	
Germany.....	do.....	15,541,695	1,397,216,691		1,381,674,996
Great Britain and Ireland.....	do.....	2,697,017,456	111,136,032	2,585,881,424	
Greece.....	1887 and 1888.	14,937,683		14,937,683	
Italy.....	1886, 1887, and 1888.	174,577,644	219,137	174,358,507	
Netherlands.....	1887 and 1888.	322,628,738	909,301,115	58,672,377	
Portugal.....	1886, 1887, and 1888.	54,358,528		54,358,528	
Roumania.....	1885 and 1886.	19,900,283	1,976	19,902,259	
Russia.....	1886, 1886, and 1887.		130,885,350		130,885,350
Spain.....	1886, 1887, and 1888.	116,962,663	8,914	116,953,749	
Sweden and Norway:					
Sweden.....	1885, 1886, and 1887.	86,730,728	101,702	86,629,026	
Norway.....	1886, 1887, and 1888.	26,080,692	1,031,200	25,049,492	
Switzerland.....	1885, 1886, and 1887.	77,167,000		77,167,000	
Total.....		3,977,704,749	2,927,774,067	3,354,735,644	2,214,794,982

This table shows that the continent has had, for three years at least, a surplus sufficient for more than half of the requirements of

* Montenegro, Servia, and Turkey, with its tributary States, are the only European countries not included. For these no statistics are available.

consumption in Great Britain. The details of exportation of many and other beet-sugar countries show that the larger part of their shipments abroad goes to Great Britain. The difference between these aggregates of exports and imports, 1,049,930,662 pounds is presumed to represent approximately the share of cane sugar recent consumption, say one sixth to five sixths of beet sugar. At the same time the past year's product is more than a million tons in excess of the consumption of the continent and British Isles together. The excess over recent years is twice as much as the net imports into Europe. In view of this fact, it is safe to say, for the present at least, that in Europe production has outrun consumption, with the prospect of having a constant surplus for other continents.

The farmers of the country have some responsibility in the development of the sugar industry. The product can not be made without beets, which must come from the fields of the farms. The yield of the roots depends upon their content of sugar, which depends in turn upon seed, soil, fertilization, and cultivation. This difference may vary a dollar or more per ton and represent all the possible profit in their production. Hence the farmer has a large stake in the skill and technical knowledge which yields the best results. He must learn the requirements of the plant and the details of its treatment, he must not expect to escape reduction of his profits as a necessary penalty for the blunders of his apprenticeship. The extensive preparations for beet-sugar production, east of the Rocky Mountains, were made this season at Grand Island, Nebraska, Medicine Lodge, Kansas. At the latter place beet sugar was produced last year. The results in Nebraska are so favorable that new plantations and more extended operations are planned.

The prevailing error in agricultural practice, as in some other lines of effort in this country, is to look only to the present benefit and get the largest return to-day, without a thought of the future. The beet-sugar industry involves something more than the price of a ton of beets the present year. It includes—

- (1) Rotation, which insures large yields and clean cultivation.
- (2) Symmetry in rural development, variety in production.
- (3) Fertilization, providing in large degree the material through cattle feeding.
- (4) Fine tilth and thorough cultivation.
- (5) Increased value of land, from its enlarged capacity for production, and the cheapening of cost of product and resulting increased net profit.

It would be easy to show the relative advance in value of land in beet-sugar districts, the increase of agricultural wealth, and the general prosperity enhanced by this industry. Rotation is a necessity, the soil must be enriched, though fertilizers must be applied to preceding crops and not to the crop of beets directly. Sugar-culture is only one link in the chain of production which gives variety and prosperity to agriculture.

AGRICULTURE OF CANADA.

The Dominion of Canada comprises the provinces of Quebec, Ontario, Manitoba, Nova Scotia, New Brunswick, British Columbia, Prince Edward Island, and the Northwest territories. It comprises the whole northern half of North America, except Alaska on

west, and Labrador, which belongs to the Government of Newfoundland, on the east, and in extent of territory is nearly as large as the States. The area of the whole continent of Europe exceeds it by less than 250,000 square miles. Such a comparison, however, is of little consequence, as a very large proportion of this vast territory lies in a cold, inhospitable climate, not suitable for habitation by civilized man, along the shores of the Northern Ocean and portions of Hudson Bay.

The area of the Dominion is so great that its general features of soil and climate are wonderfully varied, ranging from smiling and fertile agricultural areas to barren wastes, and from meteorological conditions resembling those which prevail over the British Isles to those of the Arctic region. Vast forests once covered practically the whole of Canada from the Atlantic Ocean to the Northwest boundaries of the Province of Ontario, and the face of the country in some districts is yet heavily wooded, the wealth of timber being one of the principal resources of many of the provinces. The soil underlying this virgin forest has been found very fertile and well adapted to a varied agriculture.

No census of the population of the Dominion has been taken since April 4, 1881, when it aggregated 4,324,810, an increase of 18.97 per cent during the preceding ten years. This census returned 1,390,604 persons as engaged in some occupation, or slightly more than one third of the total population. The proportion is almost exactly the same as the census of 1880 returned for this country, and the figures show that among the people of both countries there are very few drones in the national hive.

* * * * *

TRANSPORTATION RATES.

There have been published in each monthly crop report during the year statements showing the rates of freight upon our principal products of agriculture, and farmers' supplies, by rail and water, from the important shipping points in all parts of the country to the large market centers; also the cost of transporting our surplus products to foreign countries. It is doubtless understood that these rates were those in operation upon the first day of each month, and did not show the changes occurring between the reports.

For the first five months of the year the rate from Chicago to New York and points taking New York rates, remained the same. The returns for June 1 showed a decrease of 5 cents per 100 pounds upon packing-house products, oats, and live hogs, and an increase of 15 cents upon wool. The application of the 3 cents differential to Boston by the Grand Trunk road, and the Wabash (Canadian Pacific Dispatch Line) claiming the same right, caused another reduction in rates, as shown by the returns July 1. Dressed meats dropped from 45 to 33 cents, wheat and flour from 25 to 22½, and live cattle from 26 to 19½ cents. The rate upon wool was decreased from 65 cents June 1 to 50 cents, the same rate reported January 1. From this cause a further reduction was reported August 1. Packing-house products were reduced from 25 to 23, dressed meats from 33 to 30, cattle from 19½ to 18, and hogs from 25 to 23 cents. The returns for September 1 showed only one change, *i. e.*, wool was reduced from 50 to 34½ cents per 100 pounds.

The following table shows the rates in operation January 1, 1890, upon a few of the more important articles of shipment from Chicago to Boston, New York, Philadelphia, and Baltimore, and the changes reported during the year:

[In cents per 100 pounds.]

Articles (carloads).	From Chicago to—							
	Boston.						New York.	
	Jan. 1.	June 1.	July 1.	Aug. 1.	Sept. 1.	Dec. 1.	Jan. 1.	Aug. 1.
Packing-house products ..	35	30		28		25	30	33
Dressed meats ..	48		33	30		45	45	33
Flour ..	30		25			30	25	30
Wheat, rye, and barley ..	25		25			30	25	30
Corn ..	25					25	20	
Oats ..	25	25				30	20	
Cattle ..	26		104	18		26	26	18
Sheep ..	30					30	30	
Hogs ..	30	35		28		30	35	33
Wool ..	55	71	55		30	71	50	

Articles (carloads).	From Chicago to—							
	Philadelphia.						Baltimore.	
	Jan. 1.	June 1.	July 1.	Aug. 1.	Sept. 1.	Dec. 1.	Jan. 1.	Aug. 1.
Packing-house products ..	28	23		21		28	23	23
Dressed meats ..	43		31	28		45	30	23
Flour ..	33		20			33	19	
Wheat, rye, and barley ..	25		20			33	19	
Corn ..	18					15	17	
Oats ..	24	18				24	17	
Cattle ..	24		17	10		24	16	15
Sheep ..	25					25		
Hogs ..	28	23		21		28	23	20
Wool ..	45	52	45		32	63	47	

RATES FROM MISSOURI RIVER POINTS.

The rates from Missouri River points to Chicago and St. Louis were for a portion of the year—from April to September—in a demoralized condition than they were east of Chicago. Easy was this true of the rates upon packing-house products and upon To Chicago from Kansas City, Atchison, St. Joseph, and Omaha rates upon the former for the five months ending with September were reported at 12 cents per 100 pounds each month, and up to the latter they were from 12½ to 22 cents. June 1 the rates from Kansas City, Atchison, and St. Joseph to Chicago were reported at 12 cents for cattle and 22½ cents for sheep and hogs, and to St. Louis 9½ cents for cattle, 14½ cents for sheep, and 13 cents for hogs, rebate of \$7.35 per car, regardless of dimensions, to Chicago, \$4.50 to St. Louis.

The following statements are the carload rates, in cents per 100 pounds, as reported upon the first day of each month during the year 1890, from Missouri River points to Chicago and St. Louis.

Months.	To Chicago from—															
	Kansas City, Atchison, and St. Joseph.								Omaha.							
	Packing-house products.	Dressed meats.	Flour.	Wheat.	Other grain.	Cattle.	Sheep.	Hogs.	Packing-house products.	Dressed meats.	Flour.	Wheat.	Other grain.	Cattle.	Sheep.	Hogs.
January 1.....	18	23	22	22	20	9	12	23	18	23	22	22	20	23	22	23
February 1.....	18	18	22	22	20	12	12	23	18	23	22	22	20	23	22	23
March 1.....	18	18	22	22	20	12	12	23	18	23	22	22	20	23	22	23
April 1.....	18	18	22	22	20	12	12	23	18	23	22	22	20	23	22	23
May 1.....	18	18	22	22	20	12	12	23	18	23	22	22	20	23	22	23
June 1.....	18	18	22	22	20	12	12	23	18	23	22	22	20	23	22	23
July 1.....	18	18	22	22	20	12	12	23	18	23	22	22	20	23	22	23
August 1.....	18	18	22	22	20	12	12	23	18	23	22	22	20	23	22	23
September 1.....	18	23	22	22	20	12	12	23	18	23	22	22	20	23	22	23
October 1.....	18	23	20	20	17	22	25	25	18	23	20	20	17	22	25	25
November 1.....	18	23	20	20	17	22	25	25	18	23	20	20	17	22	25	25
December 1.....	18	23	20	20	17	22	25	25	18	23	20	20	17	22	25	25

* Rebate of \$7.35 per car, regardless of dimensions. † Wheat, rye, and barley. ‡ Corn and oats.

Months.	To St. Louis from—															
	Kansas City, Atchison, and St. Joseph.								Omaha.							
	Packing-house products.	Dressed meats.	Flour.	Wheat.	Other grain.	Cattle.	Sheep.	Hogs.	Packing-house products.	Dressed meats.	Flour.	Wheat.	Other grain.	Cattle.	Sheep.	Hogs.
January 1.....	13	18	17	17	15	13	14	21	13	18	20	20	15	16	17	17
February 1.....	13	13	17	17	15	13	14	21	13	18	20	20	15	16	17	17
March 1.....	13	13	17	17	15	7	14	21	13	18	20	20	15	16	17	17
April 1.....	13	13	17	17	15	9	14	21	13	18	20	20	15	16	17	17
May 1.....	7	13	17	17	15	9	14	21	7	13	20	20	15	16	17	17
June 1.....	7	13	17	17	15	9	14	21	7	13	20	20	15	16	17	17
July 1.....	7	13	17	17	15	7	14	21	7	13	20	20	15	16	17	17
August 1.....	12	13	17	17	15	7	14	21	12	13	20	20	15	16	17	17
September 1.....	13	18	17	17	15	13	21	21	13	18	20	20	15	16	17	17
October 1.....	13	18	15	15	12	13	17	15	13	18	15	15	12	13	17	17
November 1.....	13	18	15	15	12	13	21	21	13	18	15	15	12	13	17	17
December 1.....	13	18	15	15	12	13	17	15	13	18	15	15	12	13	17	17

* Rebate of \$4.80 per car, regardless of dimensions. † Wheat, rye, and barley. ‡ Corn and oats.

REDUCTION IN ALL-RAIL RATES.

A glance at the following table shows what a heavy decrease there has been in the rates of freight upon corn and wheat since 1870. The rates for 1871 to 1873, inclusive, showed an increase over those for 1870, but from that time there has been a steady decline, and this year's average rate upon corn is the lowest ever reported. As compared with the rate for 1870, there is a decrease of nearly 60 per cent. The wheat rate is also the lowest, with the exception of the years 1884 and 1885, when the decrease was 56 per cent for both years as compared with 1870, against 52.1 per cent this year.

The following statement shows the *all-rail* rates in cents per bushel upon corn and wheat from Chicago to New York and upon grain per 100 pounds from St. Louis to New York for the years named:

[Average rate via all]

Years	Chicago	
	Corn per bush	
	Average rate.	Per cent of decrease
	<i>Cents.</i>	
1870	28.00	—
1871	29.68	*10
1872	32.66	*10
1873	28.98	*3
1874	24.37	12
1875	22.30	20
1876	18.74	42
1877	18.00	22
1878	16.52	41
1879	14.66	48
1880	17.48	27
1881	13.40	52
1882	13.50	51
1883	15.12	40
1884	12.32	58
1885	12.32	56
1886	14.00	50
1887	14.70	47
1888	13.54	51
1889	12.89	54
1890	11.31	59

* Increase.

† Corn 35 cents.

MONTHLY RATES FROM

To show a comparison of the rates upon important articles from Chicago to New York by trunk lines upon the first day of each month the following statement is presented:

[In cents per 100 pounds]

Months.	Cattle, carload.					Sheep	
	1886.	1887.	1888.	1889.	1890.	1886.	1887.
January 1	35	35	35	224	25	25	45
February 1	35	35	35	224	28	25	45
March 1	35	35	35	224	28	45	45
April 1	35	35	35	224	28	45	40
May 1	35	35	35	26	28	45	40
June 1	35	35	25	36	30	45	40
July 1	35	35	164	26	194	45	40
August 1	35	35	84	20	18	45	40
September 1	35	35	10	36	18	45	40
October 1	35	35	15	26	18	45	40
November 1	35	35	15	24	18	45	40
December 1	35	164	15	26	20	45	19

Months.	Grain and flour, carload.*				Packing:	
	1886.	1887.	1888.	1889.	1886.	1887.
January 1	25	30	274	25	25	30
February 1	25	30	274	25	25	30
March 1	25	30	274	25	25	30
April 1	25	30	25	25	25	30
May 1	25	25	25	25	25	30
June 1	25	25	25	25	25	30
July 1	25	25	25	25	24	30
August 1	25	25	25	25	24	30
September 1	25	25	25	25	24	30
October 1	25	25	30	25	24	30
November 1	25	25	30	25	24	30
December 1	25	25	30	25	25	30

* Not including unground corn after August 1, 1889. Freight on corn was 20 cents per 100 pounds, and December 1,

LAKE AND CANAL RATES.

The rates upon corn and wheat via lakes, Chicago to Buffalo, were much lower during 1890 than they were during 1889. In the early part of the season, in fact before navigation was fairly opened, or shippers of ore or other products were ready for business, there was a great demand for loads at the larger ports by the vessel men. This caused a temporary glut of tonnage at Chicago, which reduced rates upon all classes of lake traffic. Oats were carried in May from Chicago to Buffalo as low as $1\frac{1}{2}$, corn $1\frac{1}{2}$, and wheat $1\frac{1}{2}$ cents per bushel. Later in the season, June and July, the rates were somewhat higher, but for the entire season of navigation they were quite low.

Rates via Erie Canal, Buffalo to New York, were also much lower the past season than they were during 1889. Unlike the lake rates, they opened strong, and remained quite steady throughout the season.

Statement showing the weekly range of rates of freight upon corn and wheat, Chicago to New York, via lakes and canal, for the years 1888, 1889, and 1890.

[In cents per bushel.]

Week ending—	Lake, Chicago to Buffalo.						Erie Canal, Buffalo to New York.						Chicago to New York, lake and canal.					
	1888.		1889.		1890.		1888.		1889.		1890.		1888.		1889.		1890.	
	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.
May 10.....	2	1	2	2	1	1	5	...	4	3	2	4	2	7	6	5	5	5
17.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
24.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
31.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
June 7.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
15.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
22.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
30.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
July 7.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
14.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
21.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
29.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
Aug. 7.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
15.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
23.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
30.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
Sept. 7.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
15.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
22.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
30.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
Oct. 7.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
14.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
22.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
30.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
Nov. 7.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
15.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
22.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5
30.....	2	1	2	2	1	1	3	3	4	3	2	4	5	4	4	5	5	5

TRANSATLANTIC RATES.

Ocean freight rates generally have been much lower than they were for the year 1889. For the first four months of the year, or until about May 1, the rates were considerably higher, but from that time they decreased very rapidly, making the average for the year nearly 30 per cent lower than the average for the previous year. A prominent showing of this is found in the following comparative statement of the rates upon a few of the more important articles of export from

New York to Liverpool, as compiled from the returns from
of the larger steamship companies:

Articles.	January.		February.		March.		April.		May.		1884
	1880.	1880.	1880.	1880.	1880.	1880.	1880.	1880.	1880.	1880.	
Wheat, per bushel.	\$0.08	\$0.11	\$0.08	\$0.11	\$0.08	\$0.10	\$0.08	\$0.07	\$0.05	\$0.04	\$0.05
Corn, per bushel.	.05	.11	.08	.11	.08	.10	.06	.07	.05	.04	.05
Flour, per barrel.	.60	.72	.60	.72	.60	.72	.48	.60	.55	.35	.45
Bacon, per 2,240 lbs.	6.00	7.80	6.00	8.40	6.00	7.30	4.90	7.30	4.30	3.00	4.30
Lard, per 2,240 lbs.	6.00	7.80	6.00	8.40	4.80	5.30	4.90	5.40	3.90	3.00	4.30
Beef, per tierce.	1.30	1.44	1.30	1.44	.95	1.34	.72	1.09	.72	.48	.72
Pork, per barrel.	.84	.96	.84	.96	.72	.84	.54	.84	.48	.48	.60
Cotton, per pound.	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹
Apples, per barrel.	.72	.72	.72	.72	.65	.72	.60	.72	.60	.72	.60
Butter, per 2,240 lbs.	9.00	9.00	9.00	10.80	9.00	9.00	8.40	8.40	7.30	7.30	8.40

Articles.	July.		August.		September.		October.		November.		1884
	1880.	1880.	1880.	1880.	1880.	1880.	1880.	1880.	1880.	1880.	
Wheat, per bushel.	\$0.05	\$0.05	\$0.09	\$0.05	\$0.08	\$0.03	\$0.11	\$0.03	\$0.11	\$0.08	\$0.18
Corn, per bushel.	.05	.05	.02	.05	.08	.03	.11	.03	.11	.03	.18
Flour, per barrel.	.50	.50	.50	.50	.72	.34	.72	.34	.72	.30	.72
Bacon, per 2,240 lbs.	4.20	3.60	5.32	3.00	6.60	2.40	7.30	2.40	7.30	2.40	6.60
Lard, per 2,240 lbs.	4.20	3.60	4.80	3.00	6.60	2.40	7.30	2.40	7.30	2.40	6.60
Beef, per tierce.	.60	.60	.65	.48	1.30	.45	1.32	.48	1.44	.48	1.50
Pork, per barrel.	.84	.48	.72	.30	.72	.30	.96	.55	.96	.30	1.00
Cotton, per pound.	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹	.00 ¹
Apples, per barrel.	.60	.60	.72	.72	.72	.60	.72	.60	.72	.60	.72
Butter, per 2,240 lbs.	8.40	8.40	8.40	6.00	9.60	7.20	10.80	7.20	10.80	6.00	10.80

For comparison and record the following tables, showing the
average rates upon wheat and the monthly average rates upon
from New York to Liverpool for a series of years, are present

*Average cost per bushel for transporting wheat from New York to Liverpool
years 1886-'90.*

Years.	Steamer rates.		Years.	Steamer rates.
	Pence.	Cents.		
1886.	4.74	9.48	1879	6.30
1887.	5.18	10.36	1880	5.50
1888.	7.18	14.36	1881	4.08
1889.	6.40	12.80	1882	3.87
1890.	5.78	11.56	1883	4.54
1871.	8.16	16.32	1884	3.41
1872.	7.64	15.28	1885	3.00
1873.	10.56	21.12	1886	3.44
1874.	9.08	18.16	1887	2.71
1875.	8.07	16.14	1888	2.67
1876.	8.02	16.04	1889	4.04
1877.	6.93	13.86	1890	*2.95
1878.	7.61	15.22		

* Straight average.

*Average monthly price paid per bushel for carrying grain from New York to
pool for the years 1886-'90.*

Months.	1886.		1887.		1888.		1889.		1890
	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.	
January	3.37	6.73	4.91	9.82	3.41	6.83	4.16	8.33	5.23
February	2.30	4.60	3.65	7.30	1.83	3.66	4.35	8.67	5.41
March	2.41	4.83	3.16	6.33	.83	1.66	3.90	7.82	5.00
April	3.66	7.33	1.51	3.02	.43	.87	2.91	5.83	3.50
May	3.72	7.44	1.58	3.16	.62	1.25	3.10	6.20	3.60
June	4.73	9.46	2.12	4.25	1.66	3.33	3.41	6.83	3.60
July	2.63	5.26	2.02	4.05	1.73	3.46	3.60	7.20	2.62
August	1.53	3.06	1.83	3.66	2.33	4.66	4.33	8.67	2.65
September	2.00	4.00	1.83	3.66	5.33	10.66	4.66	9.33	1.60
October	4.00	8.00	2.00	4.00	4.50	9.00	5.41	10.83	1.50
November	4.25	8.50	3.50	7.00	4.50	9.00	5.58	11.17	1.50
December	4.66	9.33	3.00	6.00	5.67	11.33	5.60	11.20	3.00

REPORT OF THE MICROSCOPIST.

BUTTER AND FATS.

ORIGINAL MICROSCOPIC INVESTIGATIONS.

In my early microscopic observations relating to butter and other fats I recommended that, in order to procure highly crystallized fats suitable for microscopic test objects, each fat should be heated to a temperature of 212° F., for one minute, strained to remove tissue, etc., and allowed to cool slowly.

I now find that the fat should be heated, say, over the flame of a spirit lamp in a porcelain basin, until it begins to fume—no more, no less—and allowed to cool slowly in the same vessel in which it is melted. Not less than 2 ounces of fat should be melted for each experiment. Hard fats, such as beef fat, in order to obtain well defined crystallization, should be treated as follows: Melt in a porcelain basin 2 ounces of pure fresh beef fat free from tissue; heat to the fuming point; remove from the flame at once; allow it to cool slowly until it becomes semisolid; at this juncture add to it 1 ounce of sweet oil and mix; then allow it to cool slowly in a temperature of about 75° F.

If this process is strictly followed larger and better defined groups of crystals common to beef fat will be obtained than are produced by my original method.

* * * * *

REPORT OF THE SPECIAL AGENT IN CHARGE OF THE
ARTESIAN AND UNDERFLOW INVESTIGATIONS, AND
OF THE IRRIGATION INQUIRY.

THE REGION EAST OF THE FOOTHILLS.

The area covered by the artesian wells investigation of the past summer and by the one now in progress embraces nearly 700,000 square miles of territory, of which 658,000 are found east of the one-hundredth meridian. This, in the central portion of the plains, passes along the foothills to the point where the Rio Grande enters Texas. From the northeast corner of Wyoming the foothills of the Rockies make a sweeping trend to the northwest, leaving east thereof nearly or quite two fifths of Montana. This area covers the States of North and South Dakota, over one half of Nebraska, Kansas, and Texas, all of Oklahoma, with the Public Land Strip, and about one third, east of the mountains, of Wyoming, Colorado, and New Mexico. The population of this region is now estimated at about 1,250,000 persons. The amount and value of the chief grain crops produced may be stated fairly as follows: In corn 185,000,000, in wheat 125,000,000, and in oats about 75,000,000 bushels. The average cash value of all farm products grown within this area during the past year can be moderately estimated at \$275,000,000. This does not include valuable fruit and wine crops raised in some portions of the arid region. The stock interests of the same area are of great im-

portance and value. A fair estimate will give a total of 34,000,000 head of horses, cattle, sheep, and hogs, having a valuation of \$25,000,000. These bold figures are sufficient to indicate the agricultural and pastoral possibilities of the region.

In this region the average or normal rainfall from the western Gulf section to that of the extreme northwest will range from 11.11 to 14.35 inches. On the western limit it will fall at El Paso, in Texas, and Fort Buford, in North Dakota, to an annual average of 12 inches, while at the ninety-seventh meridian the average will be from north to south about 21 inches. Within these long lines and parallels the dominant topographic and other conditions very seriously affect the degree of local—even of neighborhood—rainfall. This almost entirely treeless region is always liable during the most important weeks of summer to a dangerous deficiency of the precipitation needed to insure a good harvest. The soil is almost uniformly fertile, the sunshine is seldom wanting, and the normal temperature presents a fair mean, but the earth is desiccated by frequent drought and the growing grain is devastated by the too frequent hot winds. Still, a careful analysis of the records shows that in this Great Plains and foothills section the annual precipitation is so distributed that at least one half, often more than that, falls within the growing and ripening months of May, June, July, and August. Following the lines of topography from north to south, as well as east and west, it will be seen that there is a wide difference in this respect between the semi-arid or plains region and that of the arid domain proper—the intra-basin and Sierra Plateau table and valley sections beyond the Rocky Mountains—wherein it will be found that the rainfall is greatest during the fall and winter months.

Another and a most striking series of facts consists of those which relate to the formation of the Great Plains region, in connection with the distribution of the waters thereof, whether by surface channels or underground drainage. Their breadth from east to west is almost uniform, or about 500 miles. Northwest of 100° of west longitude the areas embraced within the artesian and underflow inquiries include broken table-lands or mesa formations, the wild irregular areas known as the "Bad Lands," and a large proportion of rugged foothills. The plains themselves have quite a uniform grade of from 3 to 30 feet per mile, ranging from east to west. The whole formation has a small "dip" from northwest to southeast. In considering the drainage of this great region, in both its present and future relations to the cultivation of the soil, this general "dip" and grade must be borne in mind. Unlike the narrow Allegheny plain along the Atlantic coast, this one of the transmissouri region is traversed only by a few shallow streams, whether these be narrow or broad, in valley areas. They are all tributary to the Mississippi system; a majority are direct branches of the Missouri; but the Arkansas and its tributaries flow into the Father of Waters itself. This river system from northwest to southeast forms the important western feeders of the Mississippi River. Along the southwestern border of the plains region the Rio Grande, having a wide and open valleyway for less than 400 of its whole course of 1,200 miles, passes from the Saguache and San Juan ranges in southern Colorado, through mountain cañons, open parks, broad valleyways in Colorado and New Mexico, until, receiving the Texas tributaries in the midst of a wild cañon region, it finally reaches the open alluvium bottoms and is lost in the Gulf of Mexico a few miles below Brownsville.

The infrequency of river courses in the region we are investigating is a momentous fact which must always be borne in mind. The State engineer of Wyoming, Mr. Elwood Mead, estimates that there falls annually upon the great mountain range of that State a precipitation of snow equal to 60,000,000 acre feet—that is, 60,000,000 acres covered 1 foot deep with snow. Allowing one third for evaporation and one third for drainage, there remains in Wyoming 20,000,000 feet of such snow precipitation, or that number of acres covered 4 inches deep by water. Evaporation is generally considered to be equal to one third of the total amount of fall. It may well be questioned, however, whether such be the case within the temperate regions and at such high altitudes. Sufficient rain falls also during the year to make the annual average not less than 15 inches of water. To estimate this vast amount of moisture in the ordinary language of our eastern agriculturists, by gallons or barrels, will present an array of figures almost impossible for the human mind to grasp. Allowing for evaporation upon the mountain summits and slopes to the extent of 25 per cent, it will be fair upon entering upon the open plains region to allow for a loss of 30 per cent from the same cause. It will thus be seen that there remains unaccounted for at least 45 per cent of the total annual precipitation. It does not need a special training to perceive that this great loss from the surface water disappears into the earth itself. Of the evaporation into the atmosphere, the major portion of the moisture taken up must at some place and period return to the surface of the earth. But this is not the case with that which torrentially or otherwise disappears below that surface.

Here, then, is the problem which the investigations of last summer and autumn are endeavoring to solve. Taking into consideration the topographic and hydrographic features of the whole region, knowing something of the climatic conditions that affect the distribution of waters therein, observers, engineers, and geologists must naturally be disposed to consider the restoration of the underflow, artesian, or phreatic waters, a project of the most serious importance, but one which is not met at the outset by any stupendous outlay or vast difficulties in the way of engineering work. It is not necessary to deny the need of storage works at some not distant day; it is only desirable to consider the means by which security to agriculture may *now* be obtained and how the development of this region already so well begun can be made of a permanent and prosperous character. The labors of the past seven months have brought together such a mass of facts and testimony as to show:

- (1) That over a major portion of the region designated by law to be investigated, the rainfall, if it could be distributed when most needed, is almost if not quite sufficient for ordinary agriculture.

- (2) That the period of serious deficiency during the year is confined as a rule to within a few weeks of the summer time.

- (3) That the conditions affecting the phreatic or drainage waters of the region are even now sufficiently known to warrant the statement that these waters may readily be recovered, and in connection with the storage, distribution, and use of surface streams, afford a reasonably sufficient supply for at least two thirds of the area under consideration. It must also be borne in mind that such earth-waters are replenished every season. The experience of southern California establishes this, as so excellent an authority as Prof. E. W. Hilgard virtually maintains.

The map accompanying this report shows the location of 1,300

artesian wells now bored and flowing from north to south, between the ninety-seventh and one hundred and fifth meridians. So broadly, it may be asserted that the artesian basins which these wells have penetrated present, when the facts are collated, a striking similarity of conditions. The depth, taking elevation into consideration, will be found almost uniform. The pressure, velocity and temperature of their waters all bear a striking resemblance. The geological formations are intimately related to each other in the northern half of the region are entirely similar. The variance from this statement will be found in the Denver artesian basin, which is probably fed by secondary rather than primary deep drainage; also in the tertiary basins of western Kansas. None in the world presents so large a present and possible supply of artesian water, and none yet known to us covers so wide a range and embraces such a large territory.

THE DAKOTA ARTESIAN BASIN.

The vast extent of the Dakota artesian basin has been testified by the inquiries and deductions of the engineers and geologists. Even a slight acquaintance with the chief features of the physical geography of the Dakotas strongly points to the probable permanency of the water supply. The western mountain drainage penetrates below the superincumbent stratum to the body of the rock known as the Dakota sandstone. It is evident that the water has nowhere penetrated more than a few inches of this water-bearing and conserving stratum. The altitude, the general trend of the land and the formation and character of the great hydrological or drainage area which intersects it, give weight to the deductions that are made as to extent and permanency. There are found within it over a hundred and fifty high-pressure artesian wells, including, within the Dakotas, the few bored in the Yellow Stone Valley of Montana. There are also found in South Dakota several hundred flowing wells whose supply is evidently from sources not identified with the great artesian basin. In northeast Dakota, in the hydrological basin of the Red River, claimed by geologists to be the seat of an ancient lake, there are nearly a thousand small flowing wells, whose waters are used largely for farming and stock purposes, as a garden and other small irrigations. No diminution of present supply anywhere reported. The source of their supply is from the beds of glacial drift. The people who have settled in the Dakotas belonged originally to States wherein the practice of irrigation was unknown. Active settlement began in these two new commonwealths during years that were blessed with considerable rainfall. A few years more, however, have proven conclusively that the present moment of insecurity as to rainfall is really a permanent one. It would be folly to deduce from such a short period of years as this in which observations have been taken any theoretical deductions claiming authority for its statement; but it is evident, not only from climatic observations in the Dakotas, but from those taken throughout the Great Plains region, and extending over a longer period, that there is something like a periodicity of abundance and drought, covering, so far as can now be deduced from observations, cycles of from seven to nine years in duration. And perhaps even a more important feature for the establishment

agricultural security in the Dakotas as well as elsewhere on the Great Plains, is involved in the possibility of realizing a more equitable distribution of the rainfall, and it may reasonably therefore be assumed that over a large portion of the area under consideration the annual rainfall is almost or quite sufficient, if it could be evenly distributed as to area or controlled in its fall as to time. The fact remains that there is no equality in the distribution either in area or time.

Evidence tends to show that human industry applied to the land has already greatly modified the phenomena of distribution. Naturally enough those who have observed such features have hastened to the conclusion that these modifications tend also to a permanent change of climate. It may, however, safely be assumed that so much of this conclusion is correct as warrants a belief in the modifying and ameliorative effects, locally speaking, of human industry upon our semi-arid soils and region. What the farmers of the Northwest desire and what they need is development of the water supply which lies beneath their feet, and which they may find immediately at their gates. Over the eastern half of the twin Dakotas they are not absolutely dependent upon irrigation. For industrial security, however, they need the power to draw upon supplies stored in wells or reservoirs. The harsher and larger climatic conditions at their period of need prove too often destructive of all their labor and its results. Such a supply as will meet this want, not large but imperative in character, seems to be at their command in the wonderful artesian basins that unquestionably lie within the borders of the two great States, and which will probably be found to also serve a considerable area of northern and eastern Montana.

The people who had settled within this new northwestern section, and who have recently brought to the Union five great and important commonwealths, have paid into the Treasury of the United States for the public lands they have reclaimed and made fertile from \$35,000,000 to \$40,000,000. In the Dakotas alone the total of land payments exceeds \$25,000,000. By adding the great sums paid by settlers to land-grant corporations we shall have, in all probability, a total of \$35,000,000 for the Dakotas alone. A great net work of railroads has already been constructed, and prosperous towns and villages have already been founded by the hundred. The Dakotas are famous in the markets of the world for the production of wheat. The commerce of the nation has been greatly increased by the growth and shipment of this its particular and valuable grain.

The popular feeling in the Dakotas, especially south of Devil's Lake and west of the Red River Basin, has settled during the progress of the investigations into a public opinion, which asks of the General Government a full and comprehensive investigation of the limits east and west, north and south, of their remarkable artesian basin. It is urged that this investigation does not involve the necessity of a protracted topographical survey; that the altitude and other physical features of the country are all well established and known; that the work of the geologist and engineer can necessarily be confined to a reconnaissance of the country in which the outcropping and the altitude both afford proof sufficient to warrant the belief that therein will be found the western limit of the water-bearing basin. The people interested are unanimous in asserting that the one important help they now require is the sinking and boring by the General Government of a range of experimental wells westward from the James

River Valley, such as will show to the settler and private capital the possibilities involved and the practicability of obtaining at moderate cost the artesian waters known to exist. With such help these communities assert their ability to obtain capital by which to enable the counties and towns of each State to purchase machinery to sink wells and to construct storage reservoirs, sufficient in number to make secure their present great agricultural possibilities and enable them to maintain the homes which as pioneers they have won from the wilderness. The reports of Engineer Nettleton and Geologist Hay, as well as a thousand confirmatory facts and observations, all tend to strengthen the views so generally expressed by the people of the Dakotas.

During the past year, and largely since the action of Congress in appropriating \$20,000 for the first investigation, great activity and interest have been manifested in this matter of water supply. In South Dakota a considerable number of wells have been sunk or are now in process of being drilled. Inspiration to such investment and effort has arisen largely from the presence of the Department agents in that region, and through the great discussion in progress over the questions of artesian and underflow supply. Under a law passed by the first State legislature of South Dakota, as an amendment to one passed by the territorial legislature, the counties are permitted to issue bonds for the raising of money wherewith to pay for the sinking of wells. In some of the more populous counties already large preparations are being made for the purpose—one, the county of Brulé, proposing to spend in all about \$1,500,000 for this purpose. During the past summer, under the encouragement afforded by the practical teaching and experience of Engineer Nettleton, as well as by the current discussion, several efforts were made to irrigate small areas of land by water from artesian wells. About 500 acres have been so irrigated. In several instances the reports made to the Department, through the office of irrigation inquiry, show results of most encouraging character. The yield on the land irrigated has been from ten to fifteen times as great as on unirrigated portions of the same field or farm. Within the States of North and South Dakota, by water from negative artesian wells (in the Red River Basin in Miner and Sanborn counties), there are now about 3,000 acres under irrigation. This excludes the southwestern portion of South Dakota, known as the Black Hills, in which irrigation by ditches and from surface streams is already quite extensive, embracing about 15,000 acres. Evidence comes from this region as to the practicability of reinforcing the surface supply by extensive drainage deposits.

THE CENTRAL PLAINS AND THE UNDERFLOW REGION.

One of the most remarkable of the series of facts which the investigation has so far brought together relates to the existence of great deposits of drainage water at a moderate depth below the alluvium, the existence of which supply has so far been quite well established at different points within the central division of the Great Plains, embracing a large portion of western Nebraska and eastern Wyoming, as well as the greater portion of western Kansas and eastern Colorado, with a considerable area in the Indian Territory and the adjacent section of New Mexico. It also dem-

onstrated, through the actual finding of water at moderate depths, to be underlying the moderately elevated plateau or table-land known in Texas as the "Staked Plains." Without doubt investigation will establish the same condition in the Panhandle region of that State. This phreatic supply differs in degree and perhaps in volume from that which is found underlying the surface in the wide regional river valleys, such as the Platte, the Arkansas, and Cimarron. The substratum, permeated by the percolating flow of the rivers, is largely composed of sand, the movement through which, although continuous, must be much slower than that through the looser gravel stratum. The continued rise westward at a steady grade per mile has induced the engineers and canal owners within the upper Arkansas Valley to construct works for the utilization of this great body of undersheet water. Such works are already in partial but successful operation at Dodge and Garden Cities in western Kansas. The owners of the Eureka Canal are fully expecting to supply that large irrigation ditch with water from the sub-canals and reservoirs that have been constructed at and near Dodge City. Similar works are now in process of construction in the valley of the North Platte, Nebraska. A number of submerged dams have also been successfully constructed and operated at points in Colorado, by means of which the flow of streams otherwise diffused and lost below the surface has been successfully stored and utilized for irrigation and other domestic purposes. Civil Engineer Van Diest, of Denver, who was in charge of the geological examination of eastern Colorado and New Mexico, in closing his valuable report has the following to say in regard to both artesian and underflow waters and their relations to irrigation uses:

The artesian flows are means for transfer of water from high humid regions to more arid tracts.

The advantages of such process over transfer of water in irrigating ditches are that it costs nothing, that there is no loss by evaporation and seepage, and that the supply is uniform and practically independent of a dry season.

The hydrostatic pressure forces the supply to a point where the water is needed, provided a communication is made between the underground flow and surface. If the depth of water supply is not too great the cost of boring will in many cases be less than the cost of bringing the water by long ditches to the land.

The limit of depth to which boring for water can advantageously be undertaken is largely dependent on the amount of supply that can be obtained and on the kind of crop that can be raised on the land to be irrigated.

It will pay to bore to a considerable depth for the irrigation of fruit trees and garden truck when the flow is small, while for raising wheat it may not pay to bore at a moderate depth, even when the flow is large.

The utilization of artesian flows has a great disadvantage in the many requisites of a flowing artesian well. Only at a few places in eastern Colorado and New Mexico are these several conditions so happily combined that artesian wells are cheaper means of irrigation than by lateral distributing from surface ditches. Another drawback is that artesian wells must necessarily be bored at lower levels than the collecting area, and consequently are not beneficial at points located higher than can be reached by ditches. On these grounds the artesian well can never become a very important factor in irrigation in Colorado and New Mexico, but it may be in many places a great benefit when the water supply from other sources is small.

In eastern Colorado, where the climatic conditions and the soil limit agriculture to cereals, an artesian well does not give a sufficient supply for so large a tract as such a culture requires to become profitable. It is, however, an excellent auxiliary to the efficacy of the ditch. The farmer who has an artesian well in addition to his ditch lateral has an advantage over his neighbor similar to the advantage in the time before the opening of the Suez Canal of the Indian merchantman with auxiliary steam-power over the sailing vessel for weeks becalmed within the tropics.

The utilization of underground flows without hydrostatic pressure is not so limited as the utilization of the true artesian flow. The collecting area of this

kind of subterranean flow is in eastern Colorado and New Mexico vastly greater than of artesian flows; they occur at less depth, and although they have feeble or no pressure and must be raised artificially to the surface they can be found in great volumes to points higher than ditches from neighboring streams can reach. The possibilities of bringing productiveness to a large area of arid land by the utilization of these underground flows are great. They may become in the future very important factors in the work of irrigation, and deserve a closer more detailed investigation than the very limited time of the present investigation allowed to devote to this problem.

Mr. Van Diest has paid great attention to the science of hydrology and has had a remarkable experience in the construction and direction of hydraulic work related thereto, having served as engineer in Holland (his native country), France, England, Java, India, Japan, and in the United States, of which he is a citizen.

Observations made by Professor Hilgard, of the University of California, strongly confirm the practical experience which has been shown already in Colorado and elsewhere the extent and feasibility of this great underflow supply. As great an authority as Professor Sterry Hunt declares that 1 square mile of sandstone 100 feet thick will contain, when thoroughly saturated, water enough to flow continuously 1 cubic foot per minute for a period of thirteen years. Pure sand when saturated contains from 30 to 40 per cent of its volume in water, while the more porous gravel will hold 25 per cent, and certainly a freer space for the element to move in. In sandy soils which are always porous, the water will rise or fall with the temperature and the changes of climate. A fall of 6 feet to the surface and that of the rivers on the central plains is much greater, and will give from saturated sand and gravel a steady discharge of from 40,000,000 to 50,000,000 cubic feet per square mile.

A cubic foot of fine sand it is estimated will contain 2 gallons of water, of coarse sand $2\frac{1}{2}$ gallons, of sand and fine gravel 3 gallons, while a cubic foot of coarse gravel and small stones will contain about $3\frac{1}{2}$ gallons. The porosity of sand is equal to about one-tenth of its cubical volume. To 1 square yard of quartzoid sand 33 per cent of water can be added; to marl can be added at least 15 per cent of water. Clay, when dry, will absorb about 12 per cent; loose gravel, sand, and small stones will take up from 15 to 20 per cent of its space in water. Given these conditions and keeping in view the contours of the earth and the vast topographical features of the region under consideration, it may be readily perceived that there is a great deal more than hypothesis or conjecture in the underflow proposition. Indeed the array of data and of facts already collected presents such an amount of proof as to justify the conviction that everywhere throughout the arid and semi-arid regions it will be found over very large areas to be a prospective source of water of great industrial importance. Already large and prosperous manufacturing factories of pumping and lifting machinery have been established, and among the papers that will be embodied in the supplementary report on underflow will be found a report from the manager of one of the most important of these new enterprises.

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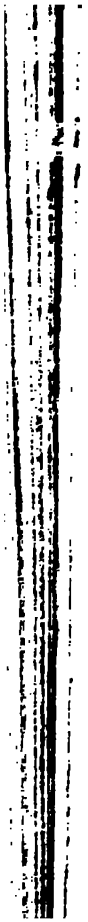
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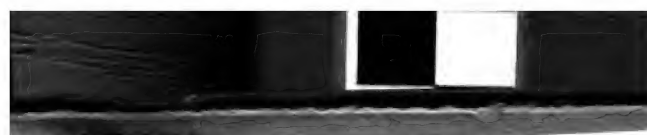
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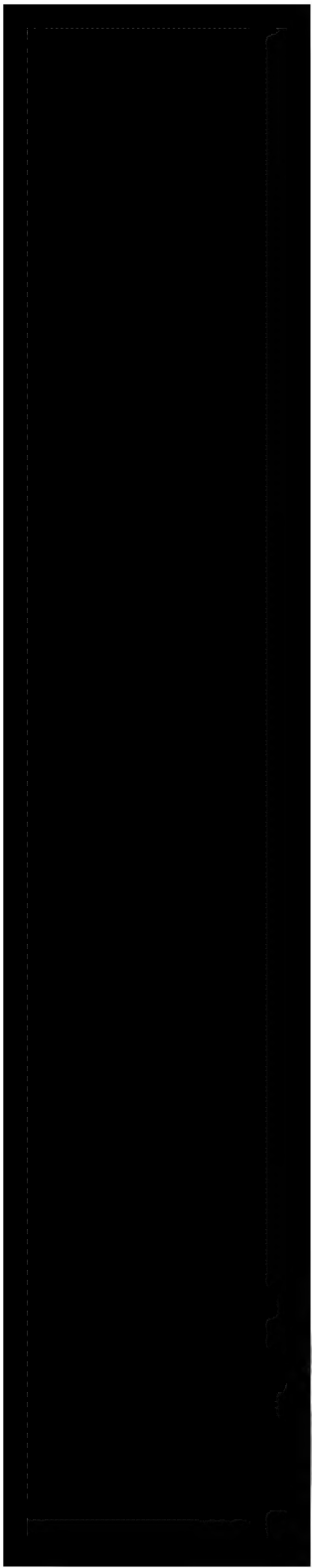
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